

Data in Table 1 allow a direct comparison of the frequency of juveniles between the two collecting periods. For all species of which juveniles were collected, except the South Island saddleback *Philesturnus carunculatus*, the proportion of juveniles dropped. To test for statistical significance, a one-tailed version of Fisher's exact test (Zar 1984: 390) was used to examine the probability that the proportion of juveniles in Table 1 had declined by chance. The ratio of juveniles declined from 17.5% in the 'Second Collection' to 6.2% in the 'Third Collection', and the degree of this decline approached statistical significance (left-tail, $p=0.054$). Cumulative totals of specimens from each collection and age category ('Second Collection' adults and juveniles and 'Third Collection' adults and juveniles, total $n=163$) were used because the samples were too small to test for the trend within each species. To improve resolution of trends for individual species where juveniles were included in at least one collection (Table 1), a sign test (Zar 1984: 386) of the probability that the trend was by chance showed a significant (one-tailed test, $p=0.011$) decline in the frequency of juveniles between the two periods.

By the 1890s, no juveniles were collected for 87% of the mainland species listed in appendices 4 and 5 that are now threatened or extinct. This suggests that predation of nests and young was just as important as adult mortality in the ultimate demise of a number of New Zealand birds. It provides support for Atkinson's (1985: 69) contention that the arboreal ship rat *Rattus rattus*, introduced to New Zealand in 1858–65 (Atkinson 1985: table 1), was a primary agent in the extinction of many bird species, even in remote parts of the New Zealand mainland. However, although ship rats raided nests, the adults of many such birds ultimately succumbed to predation – especially by feral cats *Felis catus*, present from the 1830s (King 1990: 335), and stoats, present from 1885 (King 1990: 293) – as graphically illustrated by Tennyson & Martinson (2007: fig. 3).

Notes on individual species

Nine species listed in Table 1 (except the South Island saddleback) showed a decline in frequency of juveniles between 1859–86 and 1891–98, and five of these were extinct on the mainland by the early twentieth century. The remainder (little spotted kiwi, North Island weka *Gallirallus australis greyi*, kākāpō and South Island bush wren *Xenicus longipes longipes*) are now also extinct or threatened on the mainland. In the 'Third Collection' there are no juveniles of any of these nine species, except for little spotted kiwi and huia. In another seven extinct or threatened species, there were no juveniles in either collection (Table 1).

No skin or mount of a North Island saddleback *Philesturnus rufusater* was sold by Buller to Rothschild or to the CMNH (see appendices 4 and 5). A careful reading of Buller's publications suggests that he only ever had two skins, from the Wairoa River (Kaipara), dated 1852. One of them was later mounted and donated to the Auckland Museum in 1855, but is now lost (B.J. Gill, pers. comm. 2008). Buller (1887: 20) also says that he donated an egg of this species to the Colonial Museum, one of a clutch of three collected by Hutton on Little Barrier Island on 27 December 1868. None is identifiable at the NMNZ as from Buller today, although there are three old North Island saddleback eggs without data in the collection. Buller never recognised the North Island saddleback as a discrete taxon, which perhaps explains why he apparently did not try harder to obtain more specimens of that species.

Saddlebacks were common throughout North Island forests before 1870 (Oliver 1955: 514), being abundant even near Wellington in 1855 (Buller 1906: 161). They disappeared from the North Island much more rapidly than kōkako, probably because they favour ground feeding and often breed and roost in cavities near the ground (Oliver 1955: 514; Lovegrove 1996: table 9). These behaviours made them particularly susceptible to cat predation, even on islands that had few other predators, such as Little Barrier, Great Barrier and Cuvier. Cats became feral on Little Barrier Island in the 1870s (Hamilton 1961: 132; Miskelly 1988: 278) and saddlebacks were last seen there in 1882 (Hamilton 1961: 173). The rapid decline of North Island saddlebacks on the mainland preceded the introduction of mustelids and occurred 20 years earlier than in the South Island (Oliver 1955: 514). Buller (1888b: 17) records that saddlebacks had 'now entirely disappeared from the North Island, being met with only in some wooded islands in the Hauraki Gulf'.

In contrast, the South Island saddleback was the only species listed in Table 1 to show an increase in the number of juveniles collected in the 1890s. Also notable is that more than half of the mainland South Island saddlebacks in the NMNZ collected from 1890 to 1905 are juveniles (7 out of 13). Thus, there is no proof that productivity declined in this species before its extinction on the South Island mainland, which is estimated to have occurred in 1905 (Hooson & Jamieson 2003: 191).

Buller (1906: 135) described South Island piopio as 'fast expiring' in the South Island, but they still abounded on Stewart Island in 1896 (Buller (1906: 162), contra Checklist Committee (1990). Buller also recorded (1906: 165) that

Table 1 Comparison between Buller's 'Second' and 'Third' collections to show a decline in number of juveniles of extinct and threatened land and freshwater bird species, obtained on the New Zealand mainland.

	'Second Collection' (collected 1859–86)		'Third Collection' (collected 1891–98)		Current status on mainland
	adults	juveniles	adults	juveniles	
South Island brown kiwi	5	0	3	0	Threatened
Little spotted kiwi	8	2	5	1	Extinct
New Zealand little bittern	2	0	1	0	Extinct
Brown teal	4	0	2	0	Threatened
New Zealand quail	3	1	3	0	Extinct
North Island weka	2	2	6	0	Threatened
Kākāpō	11	2	5	0	Extinct
Orange-fronted parakeet	2	0	2	0	Threatened
Laughing owl	6	1	3	0	Extinct
South Island bush wren	5	1	8	0	Extinct
Yellowhead	3	0	6	0	Threatened
North Island kōkako	4	0	2	0	Threatened
South Island kōkako	2	0	2	0	Extinct
South Island saddleback	11	1	8	2	Extinct
Huia	6	2	5	1	Extinct
North Island piopio	2	1	1	0	Extinct
South Island piopio	4	1	3	0	Extinct
TOTALS	80	14	65	4	n = 163

Brough still found them in the 'Nelson district' [upper Karamea River] in 1895 or 1896. The NMNZ has two South Island piopio obtained by L.J. Vangioni from near Queenstown in 1893, and four obtained by H.H. Travers from the Nelson district in August 1897. It thus appears that they, too, were widespread until about 1900. After the introduction of mustelids (on the mainland) and feral cats (on Stephens and Stewart islands), these fine songsters declined precipitously, becoming extinct by about 1905 (Tennyson & Martinson 2007).

The mainland decline of both of the above species was later than for their congeners in the North Island. Perhaps this reflected the slower rate of forest clearance in the South Island and, as a consequence, a temporary buffering of the effects of introduced mammalian predators.

Discussion

Difficulties faced by the Colonial Museum

In 1865, the Colonial Museum and Laboratory was founded in Wellington by the New Zealand government on the initiative of James Hector. Hector was appointed Director of the Museum, the Colonial Laboratory and the Geological Survey. He was also the only qualified government field geologist and naturalist before the brief but productive employment of F.W. Hutton in 1871–73 and Alexander McKay from 1873 (Burton 1965). Initially, there were four staff, none an ornithologist, and none with qualifications or previous museum training. The official priority of developing geological collections at the Colonial Museum restricted the growth of other collections. By the time Hector retired,

there were 112,000 palaeontological specimens, with 30,000 on display (Burton 1965: 34). Throughout the nineteenth century, the Colonial Museum had few staff and inadequate collection housing (Dell 1965; Roberts & Paulin 1997; Kell 2001; Tennyson & Bartle 2008).

In addition to his main work in geological mapping and mineral surveys, Hector was the only government medical officer and had to report on all major disease outbreaks in the colony. From 1867 he also became Manager of the New Zealand Institute and the editor of its journal and, in 1885, he was appointed the first Chancellor of the University of New Zealand (Dell 1965). These responsibilities were too diverse for one man to manage effectively.

From 1881, a shortage of space in the main (unheated) museum building resulted in the vulnerable natural history reference collections being stored in a damp 'stock room' (Roberts & Paulin 1997) infested with insects and mice. Fortunately, many herbarium specimens remained packed in their original (1876) zinc-lined packing cases until the 1950s (Kell 2001), which gave them better protection than was available for the birds.

Vital political and financial support for the work of the museum and the Geological Survey was actively eroded after 1886 by the influential populist R.J. Seddon, a Member of Parliament and, later, Premier. That lack of support resulted in facilities under Hector's direction becoming run down (Burton 1965). From 1892, remaining professional staff were transferred to the now separate Geological Survey and Mines Department. Hector was left to operate the Colonial Museum and care for the collections with the help of R.B. Gore and one or two assistants. The budget was cut to a level insufficient even for maintenance of the wooden building (Burton 1965), and the failure of the Colonial Museum to document and care for Buller's '*First Collection*' resulted from those inadequate facilities, staff and resources.

Was the population of New Zealand in the late nineteenth century large enough to support a professionally run museum? The European population of New Zealand was 171,000 in 1864 (Te Ara 2007), larger than that of Chicago and comparable with Boston at the time (Gibson 1998). Yet, both North American cities succeeded in establishing fine and well-funded museums, suggesting that the importance of museums for natural sciences, culture and heritage was more fully appreciated there than in colonial New Zealand. By 1891, when the European population of New Zealand exceeded 624,000 people (Te Ara 2007), Premier Seddon had slashed funding for the Colonial Museum to a devastatingly low level (Burton 1965: 37).

Development of professional collection care at the Dominion Museum

In 1907, under new direction from Augustus Hamilton, the Colonial Museum was renamed the Dominion Museum. In 1914, Hamilton appointed his son Harold, aged 29, to be Assistant Zoologist (*Annual Report* 1915). An immediate start was made on cataloguing and labelling the remaining collection of New Zealand bird skins and mounts, renamed in accordance with the list of Mathews & Iredale (1913). Previously, there had been no dedicated staff caring for the zoological collections, apart from Hutton.

Despite an interruption caused by war service in France (1916–19), Harold Hamilton's initiatives led to the bird-skin collection being described as 'in good order' (Hamilton in *Annual Report* 1922). These improvements were built upon by W.R.B. Oliver (Senior Scientific Assistant 1920–28; Director 1928–47), who purchased the first nine modern steel cabinets for the skin collection in 1928 (*Annual Report* 1929). The standardised separate natural history registers and labels introduced by Oliver used sequential registration numbers for each specimen. Oliver's system was both simpler and more advanced than those used by other New Zealand museums and by the NHM, and it remains in current use today.

Oliver's appointment represented the institutionalisation of professional standards of museum care. In 1936, the bird collection was rehoused in an insect-free dedicated store-room in the newly constructed stone building on Mt Cook. The much larger building proved to be far drier and vastly superior in every respect to the old Colonial Museum building (Dell 1965), which was soon demolished. The period of neglect that caused the loss and destruction of Buller's '*First Collection*', along with many other perishable natural history specimens, had finally ended.

Inadequacy of early New Zealand bird collections for research

The failure of the Colonial Museum to document and care for natural history collections adequately was partly because it lacked expert users who might pressure the government to provide the resources needed for good storage, laboratory facilities and record-keeping. Research in New Zealand on birds during the nineteenth century was, by necessity, of an amateur nature. At the monthly meetings of the Wellington Philosophical Society (later a branch of the New Zealand Institute and the governing body of the Colonial Museum

before 1907) there was plenty of interest in, and informed debate about, New Zealand ornithology, as shown by reports in the *Proceedings of the New Zealand Institute*. However, the lack of proper storage and documentation of New Zealand museum bird collections was not raised.

Before 1936, no New Zealand bird collections were large enough for comprehensive taxonomic work. Partly because of that, most currently recognised scientific names for New Zealand birds were published by European, Australian and North American naturalists (Checklist Committee 1990). New Zealand birds were mostly named by naturalists who visited the Pacific on voyages of discovery (e.g. Forster, Sparrman, Bauer, Lesson, Garnot, Quoy, Gaimard, Hombron, Jaquinot, Giglioli, Filhol), curators of foreign museums to whom collections were sent (e.g. Shaw, Wagler, Kuhl, G.R. Gray, Gould, Ogilvie-Grant, Schlegel, Lorenz, Pelzeln, Murphy), and naturalists of independent means or with sponsors (e.g. Bonaparte, Rothschild, Hartert, Salvin, Tristram, Mathews, Iredale). Altogether, 77% of currently recognised species names of extant New Zealand birds were first coined and described by foreign naturalists. It was a German scientist, J.F. Gmelin, who named the most species, although his names are only Latinised versions of the English names given by John Latham to the birds collected during Cook's voyages (Walters 2003).

Among the currently recognised extant and historically extinct bird taxa first described by New Zealand ornithologists, more were named by Buller (11 taxa), followed by Hutton and R.A. Falla (six taxa each), than anyone later. Many names published by New Zealand ornithologists in the nineteenth century turned out to be junior synonyms of older names. This was principally because most early natural history literature was unavailable in the colony before the gifting to the nation of the libraries of businessman Charles Carter and merchant Alexander Turnbull in 1890–96 and 1918, respectively (Sutherland 2007; Traue 2007), and also because there were few comparative specimens in New Zealand museums.

Faced with those problems, and the concentration of natural history expertise in Europe and North America, it is unsurprising that most nineteenth-century New Zealand naturalists exchanged or sold their rarest and most interesting specimens to European and North American museums, collectors and dealers. To the modern New Zealand researcher, the exchange of irreplaceable specimens of rare or threatened species for skins or mounts of common European or American species seems irresponsible. However,

overseas export and exchanges of New Zealand birds made good sense in the nineteenth century, as there was a feeling in the colony that better use would be made of specimens in northern hemisphere museums. Until naturalists could obtain university education and professional employment in New Zealand, natural history research and the collections that underpinned it were bound to remain in colonial subjugation.

Neglect of bird collections by New Zealand museums in the colonial period

Although the lowest point of bird collection care for New Zealand was certainly attained at the government-run Colonial Museum between 1881 and 1914, conditions at other New Zealand museums in the nineteenth century were also very unsatisfactory. Between the Auckland Museum's foundation in 1852 and the completion of a purpose-built facility in 1876, only inadequate premises were available, and Gill (1999) reports that no birds were catalogued before 1898. Among the earliest bird acquisitions (35 mounted specimens, in 1856), only five survive today. Most of the losses occurred in the nineteenth century (Gill 1999).

Many early specimens, including types, also disappeared from the Canterbury Museum collections during the nineteenth century (R.P. Scofield, pers. comm. 2008). However, by 1922 storage was much improved, and Walter Buller's children (in London) were happy to see his remaining specimens lodged in the CMNZ (Madocks to Stead, 26 July 1921).

Buller's decision to sell his New Zealand bird specimens to northern hemisphere collectors and museums after 1871 may appear at variance with his support for New Zealand museums. In his address to the Wellington Philosophical Society on 21 August 1895 (Buller 1896: 332), he stated that 'Foreign museums are being enriched whilst our local museums are practically at a standstill'. After remarking on the 'huge' numbers of New Zealand specimens that Rothschild had accumulated, Buller (1896: 333) noted that he 'makes excellent use of them, being himself one of the most active of our working ornithologists'. Buller (1896: 333) thought the 'zoological museum at Tring is one of the most perfect of its kind in the world'. In contrast, Buller (1896: 334) found it 'little short of a scandal that, owing to the lack of proper departmental aid, scientific classification should be neglected' at the Colonial Museum. Moreover, Buller (1896: 334) felt disappointed that there was insufficient

space to display the collection of 'upwards of three hundred mounted specimens of indigenous birds' properly. He wrote (1896: 335) that 'fully half of those exhibited are not named at all', and that some of the names used were obsolete. Nowhere did Buller consider that he might actively play a part in rectifying that state of affairs.

Regarding bird collections in New Zealand museums, Buller (1896: 334) thought it 'surely high time that an effort was made to collect for each, before it is too late, a complete series of our existing native birds'. In this, he believed the Colonial Museum should take the lead. Earlier, he had written to Rothschild (Buller to Rothschild, 10 February 1895) that New Zealand museums were 'not enterprising enough to send hunters into the mountains, and will not pay the price when there happens to be a specimen on the market'. He maintained that 'they will have reason to regret it ere long, for all our wingless birds are doomed'.

Buller was not the only collector who had little faith in the local museums. Directors of the main museums (Hector and von Haast) actively collected birds for export on government-funded expeditions to the mountains. Data in our appendices show that both Hector and von Haast sold or exchanged specimens with Buller, who then sold them on to Rothschild. Other New Zealand collectors of the time, such as H.H. Travers, Dannefaerd, Reischek, Lyall and Hawkins, among others, kept their finest specimens for export to northern hemisphere museums and collectors. Only F.W. Hutton, Curator of the Otago Museum in 1873–79 and of CMNZ in 1892–1905, perhaps because of his involvement in university teaching, seems to have been 'the odd man out' in putting the needs of the local museums ahead of overseas specialists by not exporting valuable specimens (Dawson 1994).

Lack of ornithological literature and comparative material in New Zealand were two good reasons to favour depositing new or important specimens in the much larger and better resourced northern hemisphere museums. The great knowledge of the nomenclature and taxonomy of New Zealand birds that O. Finsch – based at natural history museums at Leyden and Bremen between 1861 and 1904 (Mearns & Mearns 1998: 89) – brought to his reviews of the work of Buller and Hutton reflected his access to the outstanding collections and libraries of these large institutions. Export of rare bird specimens to major northern hemisphere 'centres of excellence' continued until the 1950s, although at a reduced pace after the First World War. From that time on, New Zealand zoologists were encouraged to visit such

centres to study unique material such as type specimens. They returned with a broader vision for collection-based museum research and were able to implement their newly gained knowledge of professional standards of labelling, cataloguing and collection care.

Failure to document bird collections by colonial naturalists

Proper collection care involves the cataloguing of specimens to track loans, losses, etc. The scientific value of specimens is low unless collection data are attached. Hartert's comments express the frustration of those who have worked with birds from Buller collections. In trying to resolve the status of a new albatross (*Thalassogeron salvini* Rothschild, 1893) received from Buller, Hartert (1926: 346) wrote:

Unfortunately work with New Zealand sea birds and others is often hampered by the unscientific labelling. Very often neither exact localities, nor coloration of bill, iris, and feet, nor the sex, nor the condition of sexual organs, whether caught on breeding place or at sea, is indicated; *not in one instance are all these important details on any specimen of the Buller Collection* [authors' emphasis].

To that list of omissions we would add the exact date of collection. This information is vital for studies of plumage and moult. A slight improvement in recording dates of collection becomes evident when Buller's three main collections are compared. Only one 'First Collection' specimen and only one of the 728 'Second Collection' specimens are properly dated. Although the 588 'Third Collection' specimens are somewhat better documented, many have no date.

The lack of specimen documentation contrasts with the wealth of detail in Buller's publications. In view of his statement (Buller 1906: 166) – that these 'three collections' consecutively formed the basis for each of these works – their lack of data is remarkable. The catalogues and numbered labels that accompanied each collection when sold were apparently written at the time of sale. The arrangement of species and numbering systems used in the two surviving original Buller catalogues (at the NMNZ and AMNH) are in systematic, not chronological, order. All birds are numbered by species, not according to date of acquisition. The specimens are then listed within species by age, sex, plumage characters and specimen type. Perhaps Buller considered that such a system was optimal for sale purposes, but Rothschild, Hartert, Sharpe and Todd were not impressed.

Surprisingly, neither Galbreath (1989) nor the present authors have come across any description of a Buller collection being shown to visitors, or of their reaction. Existing independent assessments of the Buller collections include Rothschild's evaluation of the specimens as 'useless' (Buller to Rothschild, 12 September 1895). W.J. Holland (Director, CMNH) was 'not happy about the condition' of these specimens (Buller to Holland, 5 September 1905). Laura Buller (Madocks to Stead, 26 July 1921) describes how she had unpacked Buller's son's collection and found it 'in perfect condition'. The letters of Buller and his family contain no mention of cabinets or drawers, suggesting that the collection of bird skins was never available for study, but kept in boxes, ready for sale.

Prior to 1892, most Buller collection specimens were largely undocumented on the label. After this date his new standard labels had spaces for 'species', 'locality', 'date' and 'sex', but not for collector or other details. Such labels were filled out by Buller – apparently from memory – for the CMNH and the CMNZ collections. In no cases are the original collectors identified, not even Buller himself. The most obvious explanation for this was to prevent the purchaser dealing directly with Buller's collectors. However, he is quite open about the sources of his specimens in his books (Buller 1872–73, 1887, 1888a, 1905, 1906) and in his correspondence (e.g. Buller to Rothschild, 12 September 1895). Hence, it seems that Buller's failure to record collectors was the result of sloppiness and poor record-keeping, rather than an attempt to conceal information.

Procedures that alienate specimens from their provenance were characteristic of commercial taxidermists and dealers like Liardet, Dannefaerd and Smyth (New Zealand), A. Boucard and Verreaux Bros (Paris), and W.F.H. Rosenberg (London). Tens of thousands of bird skins were sold annually to museums and collectors all over the world by the last three dealers, yet very few specimens from such sources carried accurate or complete labels (Mearns & Mearns 1998: 99). In contrast, German and Austrian scientific field collectors like Dieffenbach and Reischek labelled specimens in the field and published detailed accounts of their natural history based on direct observations. These well-documented specimens provide a valuable legacy of the history of New Zealand birds, and will for ever be useful for research. Unfortunately, the bird collections of Walter Buller are, in general, of the former type, owing to their lack of documentation. Sadly, they have not proved to be as useful as he thought for the 'student of the future', especially in comparison with his published work.

Conclusions

Key findings

1. Walter Buller did not label his specimens except for sale. He removed all collectors' labels.
2. None of the three Buller collections studied was adequately labelled. Specimens in the 1871 '*First Collection*' carried only numbered tags.
3. A vital first step in the identification of Buller collection specimens was to match the distinctive numbered tags attached to the birds with the system used in his sale lists.
4. Buller did not catalogue his specimens. The sale lists that he provided (which he called 'catalogues') contain rudimentary information and last-minute additions and deletions. They appear to have been hastily prepared.
5. Buller had a poor understanding of the concept of type specimens. Most of his type specimens were not labelled as such. Contrarily, specimens listed as 'types' in the sale catalogues were often not types.
6. Most of Buller's '*First Collection*' was lost and very likely destroyed at the Colonial Museum in the late nineteenth century owing to a shortage of resources and to neglect. This loss included several types and irreplaceable specimens of rare and extinct species.
7. Buller's version of the development – and of the later disposal – of separate collections for each of his three major books is very misleading. Analyses of specimen collection dates for the three collections show that the prime purpose of acquisition of most specimens was for sale, not research. The major peaks in collecting were not immediately prior to the preparation of his books.
8. Rothschild's interest in New Zealand birds was a particularly important factor motivating Buller during the main period of his collecting, from 1886 to 1896.
9. For each collection Buller's objective was the same – acquisition of every recognised species of New Zealand endemic bird. Each of the main collections included almost all of them. For the three collections studied, Buller concentrated on threatened mainland bird species first and on seabirds last.

Walter Buller's bird collections in retrospect

Walter Buller is widely regarded as having traded in large numbers of New Zealand birds, profited greatly from this trade, and contributed to the demise of several bird species

through his collecting. The information presented in this paper shows all three of these assumptions to be wrong. Buller's tendency to exaggerate the size and importance of his collections in publications and correspondence has helped fuel these misconceptions.

It is now clear, despite his protestations to the contrary (Galbreath 1989), that Buller regularly traded in birds from 1871 to 1905, but the numbers of specimens were not great. Compared with the collections of A.O. Hume in India (102,000 specimens), J. Dwight in the USA (65,000), or Mathews in Australia (30,000) (Mearns & Mearns 1998), Buller's total collecting efforts were slight. Reischek took at least 2278 birds (including nests and eggs) to Austria after his 12 years in New Zealand (Westerskov 1990), and we estimate that he collected at least another 1000, when his sales to Buller, Rothschild and to New Zealand museums are considered. Nearly all of these specimens were collected, prepared and documented by Reischek himself.

Buller's sales to the four institutions discussed in this paper (Colonial Museum, Rothschild Museum, CMNH and CMNZ) totalled about 2230 specimens, collected over some 50 years, for which he or his family received at most £3492. Allowing for inflation, the average price per specimen (£1.57) was quite similar to that paid to John Gould for his collection of Australian birds by the Philadelphia Academy of Natural Sciences in a previous era (Stone 1938). If £10–26 was paid to collectors for rare species (Buller to Hector, 27 December 1871; Buller to Rothschild, 12 September 1895), then it is likely that Buller did not significantly profit from his collections, and may even have lost money on them.

Finally, there is no evidence that Buller's collecting activities contributed to the decline or extinction of any New Zealand species. Seven bird species were certainly exterminated in New Zealand during Buller's time, and many others declined greatly, as recorded in his books. However, this period coincided with the main phase of European settlement, with the clearance of forest for farming and with the spread of several mammalian predators, particularly mustelids (stoats, ferrets and weasels) introduced to control the plague of rabbits *Oryctolagus cuniculus*. The arrival of ship rats and the introduction of cats to several important mustelid-free islands (Little Barrier, Great Barrier, Stephens and Stewart) also led to many bird extinctions (King 1984). Buller supported removing huia from the dangers of the mainland to predator-free island reserves, although he continued to collect them (Galbreath 1989). However, the total number of huia collected by Buller (only 24 altogether, sold

by Buller or his family to the Colonial Museum, Rothschild Museum, CMNH and CMNZ) pales into insignificance alongside the 646 reportedly shot in a single month by Māori feather-hunters in northern Wairarapa in the 1880s (Buller 1887: 14).

Buller's contribution to New Zealand ornithology lay in documenting the variety, unique character, habits and distribution of New Zealand birds in his great books. These works first brought to the world the beauty of New Zealand birds and the uncertainty of their survival. In contrast, the value of Buller's collections was undermined by his failure to develop high standards for the preparation and labelling of his specimens and by the inability of the New Zealand government to care for them. Improved standards set by Rothschild at his private museum probably resulted in the better documentation of Buller specimens in the CMNH and in the CMNZ. But many important Buller collection specimens – including many types – had by then been lost for ever.

Ornithology was Buller's passion and his hobby. He never sought to develop his skills in a museum context. His amateurishness and unsystematic approach to collecting specimens characterised locally born New Zealand ornithologists during the nineteenth century. Buller failed to prepare and document his specimens adequately, but his collections – in conjunction with his published work – testify to the devastating impact of humans and introduced predators on the avifauna of New Zealand in the nineteenth century.

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Appendix 1:

Catalogue of Buller's 'First Collection' sold to the Colonial Museum

Entries are listed by Buller Collection number and arranged as follows:

1. Current English and scientific names.
2. Scientific name and author as given by Buller in the original list.
3. Buller number, age (ad. = adult; juv. = juvenile) and sex of specimen, whether mounted, and other notes from Buller's lists (MS 1871a).

Notes

1. This list follows the original format closely, with modern names added.
2. Within species, as originally listed, it is often unclear which number is associated with which specimen. For example, Buller lists wrybill nos 123 and 124, and notes that a male and female are represented. We assign numbers in the order in which Buller lists specimen details. In this example he listed the male before the female, and thus we list the male as 123 and the female as 124.
3. Eleven specimens are listed by Buller in an appendix, with numbers bearing a superscript letter that fit into the main sequence. In this list these specimens have been integrated into the main numbered sequence.
4. The manuscript on which this list is based is referenced as Buller (1871a).

New Zealand falcon *Falco novaeseelandiae*

Hieracidea Novae Zelandiae

- 1 ad. ♂, mounted in case B
- 2 ad. ♀
- 3 juv. ♂
- 4 juv. ♀, mounted in case A
- 5 ♀, large variety from South Island, transitional state of plumage
- 6 juv. ♂, immature state
- 7 juv. ♂, immature state

Australasian harrier *Circus approximans*

Circus Gouldi

- 8 ad. ♂
- 9 ad. ♀, mounted in case A
- 10 very young state

11 very old state

12 ordinary plumage

Morepork *Ninox novaeseelandiae*

Athene Novae Zelandiae

13 ad. ♀, mounted in case A

14 ad. ♂

15 light variety

16 small variety

Laughing owl *Sceloglaux albifacies*

Athene albifacies

17 ad., mounted in case C

Sacred kingfisher *Halcyon sancta vagans*

Halcyon vagans

18 ad.

19 juv.

Huia *Heteralocha acutirostris*

Heteralocha Gouldi

20 ad. ♂, mounted in case C

21 ad. ♀, mounted in case C

22 juv. ♀

22^A juv. ♂

Tūi *Prosthemadera novaeseelandiae*

Prosthemadera Novae Zelandiae

23 ad. ♂, mounted in case A

24 ad. ♂

25 albino, mounted in case C

Stitchbird *Notiomystis cincta*

Pogonornis cincta

26 ad. ♂, mounted in case A

27 ad. ♀, mounted in case A

Bellbird *Anthornis melanura*

Anthornis melanura

28 ad. ♂, mounted in case A

29 ad. ♀

Chatham Island bellbird *Anthornis melanocephala*

Anthornis auriocula

30

Bellbird *Anthornis melanura*

Anthornis ruficeps Pelzeln (= *A. melanura*)

31

32

Red wattlebird *Anthochaera carunculata*

Anthochaera Bulleri (Finsch)

33 mounted in case C

Bush wren *Xenicus longipes*

Xenicus longipes

34 ad. ♂

35 ad. ♀

Rock wren *Xenicus gilviventris*

Xenicus Haastii

36 ad. ♂

37 ad. ♀

Yellowhead *Mohoua ochrocephala*

Orthonyx ochrocephala

37^A mounted in case A

38 ad. ♂, mounted in case C

Rifleman *Acanthisitta chloris*

Acanthisitta chloris

38^A ad. ♂

Yellowhead *Mohoua ochrocephala*

Orthonyx ochrocephala

39 ad. ♀, mounted in case C

Rifleman *Acanthisitta chloris*

Acanthisitta chloris

39^A ad. ♀

Whitehead *Mohoua albicilla*

Orthonyx albicilla

40 ad. ♀, mounted in case A

Rifleman *Acanthisitta chloris*

Acanthisitta chloris

40^A juv.

Whitehead *Mohoua albicilla*

Orthonyx albicilla

41 ad. ♂

Fernbird *Bowdleria punctata*

Sphenoeacus punctatus

42

Chatham Island fernbird *Bowdleria rufescens*

Sphenoeacus rufescens

43

Grey warbler *Gerygone igata*

Gerygone flaviventris

44 mounted in case A

45 mounted in case C

46 juv.

Brown creeper *Mohoua novaeseelandiae*

Certhiparus Novae Zelandiae

47 ♂

48 ♀

Silvereye *Zosterops lateralis*

Zosterops lateralis

49 ad. ♂, mounted in case A

50 ad. ♀, mounted in case A

51 ♂

52 ♀

South Island tomtit *Petroica m. macrocephala*

Petroica macrocephala

53 ad. ♂

54 ad. ♂

55 ad. ♀

North Island tomtit *Petroica macrocephala toitoi*

Petroica toitoi

56 ad. ♀, mounted in case A

Omitted number

57

Tomtit *Petroica macrocephala*

Petroica Dieffenbachi (= *P. macrocephala*)

58 ♂

South Island robin *Petroica a. australis*

Petroica albifrons

59 ad. ♂

60 ad. ♀

North Island robin *Petroica australis longipes*

Petroica longipes

61

New Zealand pipit *Anthus novaeseelandiae*

Anthus Novae Zelandiae

62

South Island piopio *Turnagra capensis*

Turnagra crassirostris

63 ♂

64 ♀

North Island piopio *Turnagra tanagra*

Turnagra Hectori (= *T. tanagra*)

65

66 local variety?

67 local variety?

New Zealand fantail *Rhipidura fuliginosa*

Rhipidura flabellifera

68 ad.

69 juv.

New Zealand fantail *Rhipidura fuliginosa*

Rhipidura melanura

70

New Zealand fantail *Rhipidura* sp.

Rhipidura Swainsoni MS

71 mounted in case A

North Island kōkako *Callaeas wilsoni*

Callaeas Wilsoni

72 ad. ♂

73 ad. ♀

74 juv.

South Island kōkako *Callaeas cinerea*

Callaeas olivascens Pelzeln (= *C. cinerea*)

75

South Island kōkako *Callaeas cinerea*

Callaeas cinerea

76 ad. ♂

77 ad. ♀

Saddleback *Philesturnus carunculatus* or *P. rufusater*

Creadion carunculatus

78 ♂, mounted in case A

Red-crowned parakeet *Cyanoramphus novaeseelandiae*

Platycercus Zelandiae

79 ad. ♂, mounted in case A

Yellow-crowned parakeet *Cyanoramphus auriceps*

Platycercus auriceps

80 mounted in case A

81 coloured variety

Orange-fronted parakeet *Cyanoramphus malherbi*

Platycercus alpinus

82 (Haast)

South Island kākā *Nestor m. meridionalis*

Nestor meridionalis

83 large South Island variety

84 large South Island variety

Kākā *Nestor meridionalis*

Nestor meridionalis

85 green variety, mounted in case A

86 scarlet variety, mounted in case C

87 yellow variety, mounted in case C

88 albino

South Island kākā *Nestor m. meridionalis*

Nestor superbus

89

Kea *Nestor notabilis*

Nestor notabilis

90

South Island kākā *Nestor m. meridionalis*

Nestor occidentalis

91 ♂

92 ♀

Kākāpō *Strigops habroptilus*

Strigops habroptilus, 4 specimens exhibiting slight variations in size and colour

93

94

95

96

Long-tailed cuckoo *Eudynamys taitensis*

Eudynamys taitensis

97 mounted in case A

98 mounted in case C

99 juv.

Shining cuckoo *Chrysococcyx lucidus*

Chrysococcyx lucidus

99^A mounted in case A

99^B juv.

New Zealand pigeon *Hemiphaga novaeseelandiae*

Carpophaga Novae Zelandiae

100 ♂, mounted in case A

101 spotted variety

New Zealand quail *Coturnix novaeseelandiae*

Coturnix Novae Zelandiae; another writer (?Hector) has noted that nos 105 and 106 were exchanged back to Buller for a lesser knot from Canterbury in February 1875

102 ad. ♂, South Island

103 ad. ♀, South Island

104 juv. ♂, South Island

105 juv. ♀, South Island

106 ad. ♂, province of Auckland

South/Stewart Island brown kiwi *Apteryx australis* subsp.

Apteryx Australis

107 ♂

108 ♀

North Island brown kiwi *Apteryx mantelli*

Apteryx Mantelli

109 ad. ♂, mounted in case A

110 ad. ♂

111 ad. ♀

112 younger ♂

113 younger ♀

114 ♀

Little spotted kiwi *Apteryx owenii*

Apteryx Oweni

115 ad. ♂

116 ad. ♀

117 young

New Zealand dotterel *Charadrius obscurus*

Charadrius obscurus

118 ad., mounted in case B

119 winter plumage

120 summer plumage

Banded dotterel *Charadrius bicinctus*

Charadrius bicinctus

121 young state

122 chick

Wrybill *Anarhynchus frontalis*

Anarhynchus frontalis

123 ♂

124 ♀

White heron *Egretta alba*

Ardea flavirostris, 5 specimens in different states – male, female and young

125

126

127

128

128^A

Reef heron *Egretta sacra*

Ardea sacra, 3 specimens – one with deformed bill

129

130

131

- White-faced heron** *Ardea novaehollandiae*
Ardea Novae Hollandiae
 132
 133
- Nankeen night heron** *Nycticorax caledonicus*
Nycticorax Caledonicus
 134 ♂, from Australia
 135 ♀, shot in Wellington
- Australasian bittern** *Botaurus poiciloptilus*
Botaurus poicilopterus, a series illustrating the differences of plumage
 136 ad. ♂, mounted in case B
 137
 138
 139
 140
- Bar-tailed godwit** *Limosa lapponica*
Limosa Novae Zelandiae
 141 ad. ♂, mounted in case B
 142
 143
- Black stilt** *Himantopus novaезelandiae*
Himantopus Novae Zelandiae (Gould)
 144
 145
- Chatham Island snipe** *Coenocorypha pusilla*
Gallinago pusilla
 146
- North Island weka** *Gallirallus australis greyi*
Ocydromus Earli
 147 ♂, mounted on stand in Colonial Museum
 148 ♀, mounted on stand in Colonial Museum
 149 ♂
 150 ♀
 150^A juv.
 151 very young state
 152 partial albino
- Weka** *Gallirallus australis*
Ocydromus Australis, a series of fine specimens showing the tendency in this species to vary
 153
 154
 155
 156
- 157
 158 light alpine variety
- Western weka** *Gallirallus a. australis*
Ocydromus nigricans, alive in aviary – to be stuffed and forwarded
 159 ♂
 160 ♀
- Banded rail** *Rallus philippensis*
Rallus assimilis (= *R. pectoralis*)
 161 ad. ♂
 162 ad. ♂
 163 ad. ♀
 164 ad. ♀
 165 very young state
 166 doubtful whether obtained in New Zealand
- Corncrake** *Crex crex*
Rallus Featherstoni
 167 mounted
- Marsh crake** *Porzana pusilla affinis*
Ortygometra affinis
 168 ad. ♂
 169 ad. ♀
 170 doubtful if obtained in New Zealand
- Australian crake** *Porzana fluminea*
Ortygometra fluminea
 171 of doubtful authenticity but said to have been killed in Auckland Province
- Spotless crake** *Porzana tabuensis plumbea*
Ortygometra tabuensis
 172 ad.
 173 juv.
- Pūkeko** *Porphyrio melanotus*
Porphyrio melanotus
 174 [this no. was omitted from Buller's original list, but a specimen did exist because it was present in the collection c.1874 (Gore MS c.1874)]
 175 ad.
 176 ad.
 177 ad.
 178 very young state
 179 chick
 180 albino variety

Paradise shelduck *Tadorna variegata**Casarca variegata*

181 ad. ♂

182 ad. ♀

183 ad. ♀

184 young state

185 young state

Grey duck *Anas superciliosa**Anas superciliosa*

186 young state

187 young state

Brown teal *Anas chlorotis**Anas chlorotis*, different ages and sexes

188

189

190

191

Grey teal *Anas gracilis**Anas gibberifrons*

192 ♂

193 ♀

Brown teal *Anas chlorotis**Anas chlorotis*

194 young

Omitted number

195

New Zealand shoveler *Anas rhynchos variegata**Spatula variegata*

196 ad. ♂, mounted in case B

197 ad. ♂

198 ad. ♂

199 ad. ♂

200 ad. ♀

201 ad. ♀

202 juv. ♂

203 juv. ♀

Blue duck *Hymenolaimus malacorhynchus**Hymenolaimus malacorhynchus*

204 ♂

205 ♀

206 variety from South Island

207 young state

New Zealand scaup *Aythya novaeseelandiae**Fuligula Novae Zelandiae*

208 ♂

209 ♀

210 ♂

211 ♀

212 light variety

Australasian crested grebe *Podiceps cristatus australis**Podiceps cristatus*212^A ad. ♂

213 ad. ♀

214 juv.

New Zealand dabchick *Poliocephalus rufopectus**Podiceps rufopectus*

215 ♂, mounted in case B

216 ♀, mounted in case B

217 ad. state

218 ad. state

219 younger state

220 younger state

Blue penguin *Eudyptula minor**Spheniscus minor*

221 mounted in case B

222

Blue penguin *Eudyptula minor**Spheniscus undinus*

223

Fiordland crested penguin *Eudyptes pachyrhynchus**Eudyptes pachyrhynchus*

224 mounted in case B

225

Common diving petrel *Pelecanoides urinatrix**Pelecanoides urinatrix*

226

Little shearwater *Puffinus assimilis**Puffinus assimilis*

227 young, mounted in case B

228 ad.

Antarctic fulmar *Fulmarus glacialis**Procellaria glacialis*

229

Fairy prion *Pachyptila turtur*

Prion turtur
230, mounted in case B
231

Broad-billed prion *Pachyptila vittata*

Prion vittatus
232

Skua *Catharacta/Stercorarius* sp.

Lestris sp.
233

Southern black-backed gull *Larus dominicanus*

Larus dominicanus
234
235

Red-billed gull *Larus novaehollandiae scopulinus*

Larus scopulinus
236

Black-billed gull *Larus bulleri*

Larus melanorhynchus
237 ♂
238 ♀

White-fronted tern *Sterna striata*

Sterna frontalis
239
240 young

Black-fronted tern *Sterna albostrata*

Sterna antarctica
241 ad.
242 young
243 young

Australasian gannet *Morus serrator*

Sula serrator
244

Greater frigatebird *Fregata minor*

Fregata aquila
245

Black shag *Phalacrocorax carbo*

Graculus carboides
246 ad. state
247 ad. state
248 ad. state
248^A variety

Little shag *Phalacrocorax m. melanoleucos*

Graculus melanoleucus?
249

Pied shag *Phalacrocorax varius*

Graculus varius
250
251
252

Spotted shag *Stictocarbo p. punctatus*

Graculus punctatus
253
254

Little shag *Phalacrocorax melanoleucos brevirostris*

Graculus brevirostris
255
256
257

Little black shag *Phalacrocorax sulcirostris*

Graculus stictocephalus
258
259

Shag sp. *Phalacrocorax/Leucocarbo* sp.

Graculus sp. 'ocean shag'
260
261

Shag sp. *Phalacrocorax/Leucocarbo* sp.

Graculus sp. 'rock shag'
262

Unnumbered specimens in
'Memo for Dr Hector'

(Te Papa archives MU000094/001/0445)

'I. Common birds omitted in present list'

New Zealand falcon *Falco novaeseelandiae*

1 *Hieracidea Novae Zelandiae* (Colln containing several)

Sacred kingfisher *Halcyon sancta vagans*

2 *Halcyon vagans*

Tūi *Prothemadera novaeseelandiae*

1 *Prothemadera Novae Zelandiae* (Colln containing two)

Bellbird *Anthornis melanura*

1 *Anthornis melanura* ♀

Whitehead *Moboua albicilla*

1 *Orthonyx albicilla*

Fernbird *Bowdleria punctata*1 *Sphenoeacus punctatus***Grey warbler** *Gerygone igata*2 *Gerygone flaviventris***North Island tomtit** *Petroica macrocephala toitoi*1 *Petroica toitoi* ♂**North Island robin** *Petroica australis longipes*2 *Petroica longipes***New Zealand pipit** *Anthus novaeseelandiae*1 *Anthus Novae Zelandiae***New Zealand fantail** *Rhipidura fuliginosa*2 *Rhipidura flabellifera***Broad-billed prion** *Pachyptila vittata*2 *Prion vittatus* (one in collection)**Black-fronted tern** *Sterna albostrata*1 *Hydrochelidon albostrata***Grey duck** *Anas superciliosa*2 *Anas superciliosa***White-fronted tern** *Sterna striata*1 *Sterna frontalis***'II. Birds added to original collection'****Yellowhead** *Mohoua ochrocephala*1 *Orthonyx ochrocephala*, mounted in case A**North Island kōkako** *Callaeas wilsoni*1 *Callaeas olivascens?* (North)**Kākā** *Nestor meridionalis*1 *Nestor meridionalis*, canary-coloured variety, mounted in case C**Shining cuckoo** *Chrysococcyx lucidus*1 *Chrysococcyx lucidus*, young**New Zealand quail** *Coturnix novaeseelandiae*1 *Coturnix Novae Zelandiae*, North Island**North Island brown kiwi** *Apteryx mantelli*1 *Apteryx Mantelli***Little spotted kiwi** *Apteryx owenii*1 *Apteryx Owenii***Nankeen night heron** *Nycticorax caledonicus*1 *Nycticorax Caledonicus***North Island weka** *Gallirallus australis greyi*2 *Ocydromus Earli*, young states**Western weka** *Gallirallus a. australis*2 *Ocydromus nigricans***Banded rail** *Rallus philippensis*2 *Rallus assimilis*, including very young state**Fairy prion** *Pachyptila turtur*2 *Prion turtur***Black shag** *Phalacrocorax carbo*1 *Graculus carboides*, variety**Pied shag** *Phalacrocorax varius*1 *Graculus varius***Appendix 2:****Remaining 'First Collection'
bird specimens at Te Papa**

Entries are listed in taxonomic order and arranged as follows:

1. Current registration number, current English and scientific names, and conservation status (after Hitchmough *et al.* 2007).
2. Buller Collection number on label and specimen type.
3. Dominion Museum A. registration number (see Tennyson & Bartle 2008: 187), if allocated.
4. Hutton information on label (usually a scientific name and often the age and/or sex).
5. Type status and extra information, with its source, in square brackets.

Notes

1. Arrangement of specimens is by taxonomic order following Checklist Committee (1990), and then by registration number within species.
2. Buller provided no information on labels apart from the collection number.
3. ad. = adult; imm. = immature; juv. = juvenile.

OR 1221 Australasian crested grebe *Podiceps cristatus australis*. Threatened

Buller No. 213, study skin

A. 1278. Hutton: *Podiceps cristatus* ♀[ad. (Buller MS 1871a); possible **syntype** of *Podiceps hectori* Buller, 1865 (see Westerskov 1977)]

OR 1224 Australasian crested grebe *Podiceps cristatus australis*. Threatened

Buller No. 214, study skin

A. 1275. Hutton: *Podiceps cristatus* juv.

[possible **syntype** of *Podiceps hectori* Buller, 1865 (see Westerskov 1977)]

OR 1227 Australasian crested grebe *Podiceps cristatus australis*. Threatened

Buller No. 212, study skin

A. 1273. Hutton: *Podiceps cristatus* ♂

[ad. Although this specimen is numbered 212, we presume that it is 212^A because 212 should be a New Zealand scaup (Buller MS 1871a); possible **syntype** of *Podiceps hectori* Buller, 1865 (see Westerskov 1977)]

OR 5336 Blue penguin *Eudyptula minor*. Threatened

Buller No. 223, study skin

A. 1044. Hutton: *Spheniscus undina*

[Sent on loan to Otto Finsch (Hutton 1873); '*Eudyptula minor*, Gml. var. *undine*, Gould – I can not allow *undine* as a good species' (written on label by Finsch); presumably it was this individual's beak that was figured by Buller (1877: plate 15, fig. 4)]

OR 791 Black shag *Phalacrocorax carbo*. Threatened

Buller No. 248^A, study skin

A. 791. Hutton: *Graculus Novae Hollandiae* juv.

OR 816 Little shag *Phalacrocorax melanoleucos brevirostris*

Buller No. 259, study skin

Probably A. 816. Hutton: *Graculus brevirostris* juv.

[A fully dark juvenile. Although Buller MS (1871a) had listed No. 259 as a little black shag, Hutton (1871: 81) considered that Buller had misidentified 'the specimen called *G. sulcirostris* [= *Phalacrocorax sulcirostris*]', and that it was 'nothing but the young of *G. brevirostris* [= *Phalacrocorax melanoleucos brevirostris*]. In his book, Buller deleted the little black shag from the New Zealand fauna (Buller 1872–73: xv). Gore's MS (c.1874) separately listed two specimens, both numbered 259, as '*Graculus brevirostris* juv' and as '*Graculus melanoleucos* juv' [both = *Phalacrocorax melanoleucos*]. Perhaps there were two different specimens of this species with the same number]

OR 823 Spotted shag *Stictocarbo p. punctatus*

Buller No. 253, study skin

A. 823. Hutton: *Graculus punctatus*

OR 582 Greater frigatebird *Fregata minor*. Straggler

Buller No. 245, ex-mount. No original label

[juv. collected February 1863 at Castlepoint by a Māori fisherman and forwarded to Buller by George Moor/Moore (Buller 1865, 1872–73: 339, 1892); probably ♀, judging from the culmen length]

OR 623 White-faced heron *Ardea novaehollandiae*. New colonist

Buller No. 132, study skin

A. 626. Hutton: *Ardea Novae Hollandiae*

[presumed to be one of the pair that Buller 'obtained in the Porirua Harbour', Wellington, in April (Buller 1872–73: 232), probably in 1865 (Oliver 1930: 361)]

OR 624 White-faced heron *Ardea novaehollandiae*. New colonist

Buller No. 133, study skin

A. 627. Hutton: *Ardea Novae Hollandiae*

[Presumed to be one of the pair that Buller 'obtained in the Porirua Harbour', Wellington, in April (Buller 1872–73: 232), probably in 1865 (Oliver 1930: 361)]

OR 619 White heron *Egretta alba*. Threatened

Buller No. 125, study skin

A. 619. Hutton: *Ardea flavirostris*

OR 621 White heron *Egretta alba*. Threatened

Buller No. 128, study skin

A. 623. Hutton: *Ardea flavirostris*

OR 625 White heron *Egretta alba*. Threatened

Buller No. 126, study skin

A. 622. Hutton: *Ardea flavirostris*

OR 626 White heron *Egretta alba*. Threatened

Buller No. 128^A, study skin

A. 621. Hutton: *Ardea flavirostris*

OR 2213 Reef heron *Egretta sacra*. Threatened

Buller No. 129, study skin

A. 630. Hutton: *Ardea sacra*

OR 2214 Reef heron *Egretta sacra*. Threatened

Buller No. 131, study skin

A. 632. Hutton: *Ardea sacra*

OR 4774 Nankeen night heron *Nycticorax caledonicus*.

Straggler

Buller No. 134, study skin

Possibly A. 113. Hutton: *Nycticorax caledonicus*

[♀ shot in Wellington, ♂ from Australia (Buller MS 1871a);

Gore's list notes that No. 134 and another specimen from Australia are in the collection, therefore No. 134 is probably the Wellington specimen (Gore MS c.1874); the Wellington specimen was collected in 1856 (Buller 1891)]

OR 635 Australasian bittern *Botaurus poiciloptilus*.

Threatened

Buller No. 140, study skin

A. 636. Hutton: *Ardea poiciloptera*

[New Zealand (in an unknown hand on the label)]

OR 643 Australasian bittern *Botaurus poiciloptilus*.

Threatened

Buller No. 139, study skin

A. 634. Hutton: *Ardea poiciloptera*

OR 2220 Australasian bittern *Botaurus poiciloptilus*.

Threatened

Buller No. 138, study skin

A. 633. Hutton: *Ardea poiciloptera*

OR 2096 Paradise shelduck *Tadorna variegata*

Buller No. 185, study skin

A. 1232. Hutton: *Casarca variegata* juv.

OR 2164 Grey duck *Anas superciliosa*. Threatened

Buller No. 186, study skin

A. 1245. Hutton: *Anas superciliosa* juv.

OR 4603 New Zealand shoveler *Anas rhynchosotis variegata*

Buller No. 203, study skin

A. 1265. Hutton: *Rhynchospis variegata* juv. ♀

OR 1804 New Zealand falcon *Falco novaeseelandiae*.

Threatened

Buller No. 7, skin

A. 499. Hutton: *Hieracidea Novae Zealandiae* juv. ♂

OR 4794 New Zealand falcon *Falco novaeseelandiae*.

Threatened

Buller No. 5, study skin

A. 505. There is no Hutton information on the label [♀ South Island (Buller MS 1871a); ad. ♀, received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); presumably the specimen figured opposite p. 1 (Buller 1872–73: 2); present in collection c.1874 (Gore MS c.1874)]

OR 2241 Banded rail *Rallus philippensis assimilis*.

Threatened

Buller No. 162, study skin

A. 550. Hutton: *Rallus pectoralis*

[ad. (Buller MS 1871a)]

OR 2242 Banded rail *Rallus philippensis assimilis*.

Threatened

Buller No. 164, study skin

A. 545. Hutton: *Rallus pectoralis*

[ad. (Buller MS 1871a)]

OR 2251 Banded rail *Rallus philippensis assimilis*.

Threatened

Buller No. 165, study skin

A. 547. There is no Hutton information on the label

[very young (Buller MS 1871a)]

OR 2252 Banded rail *Rallus philippensis assimilis*.

Threatened

Buller No. 163, study skin

A. 548. Hutton: *Rallus pectoralis*

[ad. (Buller MS 1871a)]

OR 4758 Banded rail *Rallus philippensis assimilis*.

Threatened

Buller No. 166, study skin

A. 551. Hutton: *Rallus pectoralis* locality doubtful

OR 2281 North Island weka *Gallirallus australis greyi*.

Threatened

Buller No. 151, study skin

A. 585. Hutton: *Ocydromus Earli* juv.

OR 2268 Buff weka *Gallirallus australis hectori*. Extinct on mainland

Buller No. 158, study skin

A. 571. Hutton: *Ocydromus Earli* (alpine variety)

[*Ocydromus troglodytes* ♂ (in an unknown hand on the label)]

OR 2271 Buff weka *Gallirallus australis hectori*. Extinct on mainland

Buller No. 156, study skin

A. 574. The Hutton information is broken off the label

[*Ocydromus troglodytes* ♂ (in an unknown hand on the label)]

OR 2225 Spotless crane *Porzana tabuensis plumbea*.

Threatened

Buller No. 173, study skin

A. 600. Hutton: *Ortygometra tabuensis*

[juv. (Buller MS 1871a)]

OR 2227 Marsh crake *Porzana pusilla affinis*.

Threatened

Buller No. 168, study skin

A. 592. Hutton: *Ortygometra affinis* New Zealand [ad. (Buller MS 1871a)]

OR 2233 Marsh crake *Porzana pusilla affinis*.

Threatened

Buller No. 169, study skin

A. 591. There is no Hutton information on the label [*Porzana pusilla affinis* (in an unknown hand on the label); ad. New Zealand (Buller MS 1871a)]

OR 4205 Australian spotted crake *Porzana fluminea*.

Straggler

Buller No. 171, study skin

A. 593. Hutton: *Ortygometra fluminea* Pro[vince] of Auckland?

OR 4770 Pūkeko *Porphyrio melanotus*

Buller No. 178, study skin

A. 609. Hutton: *Porphyrio melanotus* juv.

OR 2297 Black stilt *Himantopus novaehollandiae*.

Threatened

Buller No. 144, study skin

A. 690. Hutton: *Himantopus melas* juv.

OR 4733 Black stilt *Himantopus novaehollandiae*.

Threatened

Buller No. 145, study skin

A. 689. Hutton: *Himantopus melas* juv.

OR 2390 Red-billed gull *Larus novaehollandiae scopulinus*. Threatened

Buller No. 236, study skin

A. 749. Hutton: *Larus scopulinus*

OR 2387 Black-billed gull *Larus bulleri*. Threatened

Buller No. 238, study skin

A. 745. Hutton: *Larus melanorhynchus* type Buller *Larus Bulleri* Hutton

[♀ (Buller MS 1871a); South Island, lectotype of *Bruchigavia melanorhyncha* Buller, 1869 and *Larus bulleri* Hutton, 1871 (Tennyson & Bartle 2008)]

OR 4621 Black-fronted tern *Sterna albobriata*.

Threatened

Buller No. 242, study skin

A. 721. Hutton: *Sterna antarctica* [young (Buller MS 1871a)]

OR 4622 Black-fronted tern *Sterna albobriata*.

Threatened

Buller No. 243, study skin

A. 723. Hutton: *Sterna antarctica* [young (Buller MS 1871a)]

OR 4627 Black-fronted tern *Sterna albobriata*.

Threatened

Buller No. 241, study skin

A. 726. There is no Hutton information on the label [ad. (Buller MS 1871a); received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection c.1874 (Gore MS c.1874)]

OR 1983 Kākāpō *Strigops habroptilus*. Extinct on mainland

Buller No. 93, study skin

A. 490. Hutton: *Strigops habroptilus*

OR 1985 Kākāpō *Strigops habroptilus*. Extinct on mainland

Buller No. 94, study skin

A. 488. There is no Hutton information on the label [Received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection c.1874 (Gore MS c.1874). A Reischek label is attached to this specimen with the following information, '♀ ad, collected 6 Aug 1884 at Dusky Sound by Reischek' – the data on this label conflict with the specimen being part of Buller's 1871 collection. We believe that the Reischek label has been attached to the bird in error because the Buller label retains the original green and white striped string attaching it to the specimen's leg, whereas the string on the Reischek label has been replaced. Some of the Reischek information (location and sex) has been associated with this specimen since at least 1923 because it was written by H. Hamilton in the museum's A. register]

OR 1124 Kākā *Nestor meridionalis* subsp. Threatened

Buller No. 91, study skin.

A. 443. There is no Hutton information on the label [Received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection c.1874 (Gore MS c.1874). Buller listed nos 91 and 92 as *Nestor occidentalis*. We now believe these are the 'missing' syntypes of *Nestor occidentalis* Buller, 1869, collected in Fiordland by Hector. Recently, Tennyson & Bartle (2008) believed these syntypes to be lost, because no Buller specimens of South Island kākā could be found in the Te Papa

collection and we had identified the bird labelled by Buller as 'No. 91' as a North Island kākā. However, Buller (1906: 74) specifically recorded that kākā from the Nelson district and the West Coast of the South Island are 'hardly distinguishable in size and colour from those of the North Island'. Additional information on the occurrence of *Nestor occidentalis* in the South Island is provided by Oliver (1955: 547), and a similar distribution has been found with some kiwi taxa (Shepherd & Lambert 2008). We therefore now consider No. 91 to be a **syntype** of *Nestor occidentalis* Buller, 1869, and consider that further work on the distribution of kākā taxa is urgently required]

OR 11564 Long-tailed cuckoo *Eudynamis taitensis*.

Threatened

Buller No. 99, study skin

A. 414. Hutton: *Eudynamis tahitiensis*/*Urodynamis taitensis* juv.

OR 1787 Morepork *Ninox novaeseelandiae*

Buller No. 15, study skin

A. 424. There is no Hutton information on the label [South Island (Dominion Museum register); received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection c.1874 (Gore MS c.1874)]

OR 5104 Rifleman *Acanthisitta chloris*. Threatened

Buller No. 40^A, study skin

A. 372. Hutton: *Acanthisitta chloris* ♀ [juv. (Buller MS 1871a)]

OR 5105 Rifleman *Acanthisitta chloris*. Threatened

Buller No. 38^A, study skin

A. 373. Hutton: *Acanthisitta chloris* ♂ [ad. (Buller MS 1871a)]

OR 5106 Rifleman *Acanthisitta chloris*. Threatened

Buller No. 39^A, study skin

A. 370. Hutton: *Acanthisitta chloris* juv. [ad. ♀ (Buller MS 1871a)]

OR 5086 Bush wren *Xenicus longipes*. Extinct

Buller No. 35, study skin

A. 379. Hutton: *Xenicus (Stokesi) longipes* ♀ [ad. (Buller MS 1871a)]

OR 5094 Rock wren *Xenicus gilviventris*. Threatened

Buller No. 37, study skin

A. 382. Hutton: *Xenicus Haasti* Buller = *gilviventris* ♀ [ad. ♂ (Buller MS 1871a) but probably juv. ♀, collected in the Southern Alps in the 1860s by J.F. Haast, **syntype** of *Xenicus haasti* Buller, 1869 (Tennyson & Bartle 2008); sent on loan to Otto Finsch (Hutton 1873); '*Xenicus gilviventris* Pelzeln – No doubt' (written on label by Finsch); present in collection c.1874 (Gore MS c.1874)]

OR 12586 Rock wren *Xenicus gilviventris*. Threatened

Buller No. 36, study skin

A. 384. Hutton: *Xenicus gilviventris* Rock Wren ♀ [Collected Southern Alps, 1860s, J.F. Haast; **syntype** of *Xenicus haasti* Buller, 1869 (Tennyson & Bartle 2008); ad. (Buller MS 1871a) but may be juv. (J.A. Bartle pers. obs.); received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection c.1874 (Gore MS c.1874)]

OR 1667 Brown creeper *Mohoua novaeseelandiae*

Buller No. 48, study skin

A. 310. Hutton: *Certhiparus novaeseelandiae* ♀

OR 1668 Brown creeper *Mohoua novaeseelandiae*

Buller No. 47, study skin

A. 311. Hutton: *Certhiparus novaeseelandiae* ♂

OR 1707 South Island fantail *Rhipidura f. fuliginosa*

Buller No. 70, study skin

A. 289. Hutton: *Rhipidura tristris* [Black plumage phase]

OR 5192 South Island tomtit *Petroica m. macrocephala*

Buller No. 53, study skin

A. 238. Hutton: *Petroica dieffenbachii* ♂ [ad. (Buller MS 1871a); sent on loan to Otto Finsch (Hutton 1873); '*Myiomoira* Reichb. *macrocephala*, Gml. ♂. This orange breasted form is the true *macrocephala* Gml.' (written on label by Finsch and quoted by Buller 1875b); present in collection c.1874 (Gore MS c.1874)]

OR 5198 South Island tomtit *Petroica m. macrocephala*

Buller No. 55, study skin

A. 235. Hutton: *Petroica macrocephala* ♀ [ad. (Buller MS 1871a)]

OR 1743 South Island robin *Petroica a. australis*

Buller No. 60, study skin

A. 246. Hutton: *Petroica albifrons* ♀ [ad. ♂ (J.A. Bartle pers. obs.)]

OR 1686 Silvereve *Zosterops lateralis*. New colonist
Buller No. 52, study skin
Hutton: *Zosterops dorsalis* ♀

OR 1331 Red wattlebird *Anthochaera carunculata*.
Straggler
Buller No. 33, mount
Hutton label: ‘*Anthochaera carunculata?* Matakana –
Auckland *Mimus carunculatus* Buller type’
[ad., collected at Matakana (location ambiguous – Australia
or New Zealand) on or before 1855, I. St John, **holotype**
of *Mimus carunculatus* Buller, 1865, and **holotype** of
Anthochaera bulleri Finsch, 1867 (Tennyson & Bartle 2008);
figured by Laishley in the 1860s (Sibson 1987). Buller
obtained the specimen from the Auckland Museum in 1868
(Galbreath 1989: 89). Sent on loan to Otto Finsch (Hutton
1873); present in collection c.1874 (Gore MS c.1874)]

OR 5050 North Island kōkako *Callaeas wilsoni*.
Threatened
Buller No. 74, study skin
A. 158. Hutton: *Glaucopis Wilsoni* juv.

OR 172 South Island kōkako *Callaeas cinerea*. Extinct
Buller No. 75, study skin
Probably A. 172. Hutton: *Glaucopis olivascens*
[juv. (see Buller 1872–73: 152); received by Buller on loan
from the Colonial Museum 19 May 1871 (Buller to Hector,
19 May 1871); present in collection c.1874 (Gore MS
c.1874)]

OR 5069 South Island kōkako *Callaeas cinerea*. Extinct
Buller No. 77, study skin
A. 167. Hutton: *Glaucopis cinerea* ♀
[ad. (Buller MS 1871a)]

OR 217 North Island piopio *Turnagra tanagra*. Extinct
Buller No. 66, study skin
Probably A. 217. Hutton: *Keropia tanagra*
[‘*TURNAGRA HECTORI*’ written in an unknown hand
on the label. By 1895, this was apparently the only North
Island piopio specimen remaining in the Colonial Museum
(Buller 1896)]

OR 1460 South Island piopio *Turnagra capensis*. Extinct
Buller No. 64, study skin
Hutton: *Keropia crassirostris* ♀

Appendix 3:

Missing specimens from the ‘*First Collection*’ and their data

Entries are listed in taxonomic order following the Checklist
Committee (1990), and arranged as follows:

1. Number of specimens missing, current English and
scientific names, and conservation status (after Hitchmough
et al. 2007).
2. Buller Collection number, age (ad. = adult; juv. =
juvenile), sex of specimen, and other notes from Buller’s
lists (MS 1871a).

Notes

1. The manuscript on which this list is based is referenced
as Buller (1871a).
2. Type status and extra information with its source is given
in square brackets.
3. Within species, as originally listed, it is often unclear
which number is associated with which specimen. For exam-
ple, Buller lists wrybill nos 123 and 124, and notes that a
male and female are represented. We assign numbers in the
order in which Buller lists specimen details. In this example,
he listed the male before the female, and thus we list the
male as 123 and the female as 124.
4. Specimen noted as ‘mount’ if so listed in Buller (1871a)
MS; otherwise assumed to be a study skin.

Seven North Island brown kiwi *Apteryx mantelli*.

Threatened
109 ad. ♂ mount
110 ad. ♂ [present in collection c.1874 (Gore MS c.1874)]
111 ad. ♀ [received by Buller on loan from the Colonial
Museum 19 May 1871 (Buller to Hector, 19 May 1871);
present in collection c.1874 (Gore MS c.1874)]
112 young ♂ [present in collection c.1874 (Gore MS
c.1874)]
113 young ♀ [present in collection c.1874 (Gore MS
c.1874)]
114 ♀ [present in collection c.1874 (Gore MS c.1874)]
Unnumbered

Two South Island brown kiwi *Apteryx australis*.

Threatened
107 ♂
108 ♀

Four little spotted kiwi *Apteryx owenii*. Threatened

115 ad. ♂ [present in collection c.1874 (Gore MS c.1874)]

116 ad. ♀ [present in collection c.1874 (Gore MS c.1874)]

117 young [present in collection c.1874 (Gore MS c.1874)]

Unnumbered

Six New Zealand dabchicks *Poliiocephalus rufpectus*.

Threatened

[One of the missing dabchicks was collected in 1852 at Lake Hurupaki, Whangarei, by W.G. Mair (Buller 1872–73: 351)]

215 ♂ mount

216 ♀ mount

217 ad. [present in collection c.1874 (Gore MS c.1874)]

218 ad. [South Island, present in collection c.1874 (Gore MS c.1874)]

219 young [present in collection c.1874 (Gore MS c.1874)]

220 young [present in collection c.1874 (Gore MS c.1874)]

One fluttering shearwater *Puffinus gavia*228 ad. [listed by Buller (MS 1871a) as '*Puffinus assimilis*', but reidentified as '*Puffinus gavius*' [= *Puffinus gavia*]; present in collection c.1874 (Gore MS c.1874)]**One little shearwater *Puffinus assimilis*?** Threatened227 young mount [listed by Buller (MS 1871a) as '*Puffinus assimilis*', but it may have been *Puffinus gavia*, as he later thought these species to be conspecific (Buller 1872–73: 318)]**One common diving petrel *Pelecanoides urinatrix***

226 [probably the bird that Buller found on Waikanae Beach in September 1863 (Buller 1872–73: 313); present in collection c.1874 (Gore MS c.1874)]

One Antarctic fulmar *Fulmarus glacialoides*

229 [presumably the 'dying' bird that Buller found on the beach near the mouth of the Turakina River (Buller 1872–73: 301); present in collection c.1874 (Gore MS c.1874)]

Three fairy prions *Pachyptila turtur*?230 mount [possibly a mount from the 'Buller coll.' registered as *Pachyptila belcheri* NMNZ OR 879, destroyed because of damage 7 February 1978]

2 unnumbered

Two Antarctic prions *Pachyptila desolata*?231 [listed by Buller (MS 1871a) as a fairy prion but reidentified as '*Prion banksii*' [= *Pachyptila desolata*], present in collection c.1874 (Gore MS c.1874); however, Buller at one point considered *Prion banksii* Smith to be the fairyprion '*Prion turtur*' (Buller 1875b); present in collection c.1874 (Gore MS c.1874)]232 [listed by Buller (MS 1871a) as a broad-billed prion but reidentified as '*Prion banksii*' [= *Pachyptila desolata*] and sent on loan to Otto Finsch (Hutton 1873)]**Two broad-billed prions *Pachyptila vittata***

2 unnumbered

Two blue penguins *Eudyptula minor*. Threatened

221 mount

222 [registered as '*Eudyptula m. albosignata*' NMNZ OR 5337 and formerly as A. 1053; possibly this individual's beak is that figured by Buller (1877: plate 15, fig. 3); exchanged to the Alexander Koenig Museum, Bonn, Germany, in June 1969 (Dominion Museum register)]**Two Fiordland crested penguins *Eudyptes pachyrhynchus*.**

Threatened

224 mount

225 [present in collection c.1874 (Gore MS c.1874)]

One Australasian gannet *Morus serrator*

244 [presumably the adult that Buller found 'asleep' on the coast 'between Manawatu and Otaki' (Buller 1872–73: 324); present in collection c.1874 (Gore MS c.1874)]

Four black shags *Phalacrocorax carbo*. Threatened

246 ad. [present in collection c.1874 (Gore MS c.1874)]

247 ad. [present in collection c.1874 (Gore MS c.1874)]

248 ad. [present in collection c.1874 (Gore MS c.1874)]

Unnumbered

Five pied shags *Phalacrocorax varius*

250 [present in collection c.1874 (Gore MS c.1874)]

251 [present in collection c.1874 (Gore MS c.1874)]

252 [present in collection c.1874 (Gore MS c.1874)]

262 [juv., listed by Buller (MS 1871a) as a 'rock shag' but reidentified as '*Graculus varius*' [= *Phalacrocorax varius*]; present in collection c.1874 (Gore MS c.1874)]

Unnumbered

One little black shag *Phalacrocorax sulcirostris*? New colonist258 [Hutton (1871: 81) stated that he had not 'seen any specimens of this bird', and in 1872–73 Buller deleted the little black shag from the New Zealand fauna (Buller 1872–73: xv). So this specimen may have been misidentified by Buller (1871a); it was present in collection c.1874, but listed simply as '*Graculus*?' in Gore's MS (c.1874)]

Four little shags *Phalacrocorax melanoleucos*

249 [listed in Buller MS (1871a) as the nominate form *melanoleucos*, and so the specimen was presumably in the pied plumage phase]

255 [present in collection *c.*1874 (Gore MS *c.*1874)]

256 [present in collection *c.*1874 (Gore MS *c.*1874)]

257 ['black shag' received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection *c.*1874 (Gore MS *c.*1874)]

Three spotted shags *Stictocarbo p. punctatus*

254 [present in collection *c.*1874 (Gore MS *c.*1874)]

260 [♂, '*Graculus punctatus*' = *Stictocarbo p. punctatus*; received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection *c.*1874 (Gore MS *c.*1874); originally identified by Buller as an 'ocean shag' (Buller MS 1871a)]

261 [juv., '*Graculus punctatus*' = *Stictocarbo p. punctatus*, present in collection *c.*1874 (Gore MS *c.*1874); originally identified by Buller as a 'rock shag' (Buller MS 1871a)]

One white heron *Egretta alba*. Threatened

127 [present in collection *c.*1874 (Gore MS *c.*1874)]

One reef heron *Egretta sacra*. Threatened

130 [present in collection *c.*1874 (Gore MS *c.*1874); presumably this was the specimen with the 'deformed bill' (Buller 1871a), because Buller specimen nos 129 and 131 have normal bills]

Two nankeen night herons *Nycticorax caledonicus*.

Straggler

135 [♀ shot in Wellington, ♂ from Australia (Buller MS 1871a); Gore's list notes that No. 134 and another specimen from Australia are in the collection, therefore No. 135 is probably the Australian specimen (Gore MS *c.*1874)]

Unnumbered [possibly the Westland specimen in Carnegie CMNH 24474, as this bird was collected in the 1860s (see Appendix 5) and was apparently already missing from the Colonial Museum *c.*1874 (Gore MS *c.*1874)]

Two Australasian bitterns *Botaurus poiciloptilus*.

Threatened

136 ad. ♂

137 [present in collection *c.*1874 (Gore MS *c.*1874)]

Four paradise shelducks *Tadorna variegata*

181 ad. ♂ [received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); ♀, present in collection *c.*1874 (Gore MS *c.*1874)]

182 ad. ♀ [received by Buller on loan from the Colonial Museum, 19 May 1871 (Buller to Hector, 19 May 1871); juv., present in collection *c.*1874 (Gore MS *c.*1874)]

183 ad. ♀ [present in collection *c.*1874 (Gore MS *c.*1874)]

184 young [present in collection *c.*1874 (Gore MS *c.*1874)]

Four blue ducks *Hymenolaimus malacorbhynchos*.

Threatened

[Probably some of these are part of the 'fine series of specimens in the various states of plumage' that Buller obtained in the 'autumn of 1863' in the 'upper gorges of the Manawatu river' (Buller 1872–73: 263)]

204 ♂ [present in collection *c.*1874 (Gore MS *c.*1874)]

205 ♀ [present in collection *c.*1874 (Gore MS *c.*1874)]

206 South Island [♂, present in collection *c.*1874 (Gore MS *c.*1874)]

207 young [present in collection *c.*1874 (Gore MS *c.*1874)]

Three grey ducks *Anas superciliosa*. Threatened

187 young [present in collection *c.*1874 (Gore MS *c.*1874)]

2 unnumbered

Two grey teal *Anas gracilis*. New colonist

192 ♂ [presumed to be a **syntype** of *Anas gracilis*, either shot by Buller in the Oroua Stream, near its junction with the Manawatu River in 1866, or from Napier in 1866–68 (Buller 1869, 1872–73: 250–51; Tennyson & Bartle 2008; received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871)]

193 ♀ [data as for No. 192, see above; present in collection *c.*1874 (Gore MS *c.*1874)]

Five brown teal *Anas chlorotis*. Threatened

188 [♂, present in collection *c.*1874 (Gore MS *c.*1874)]

189 [♀, present in collection *c.*1874 (Gore MS *c.*1874)]

190 [♂, present in collection *c.*1874 (Gore MS *c.*1874)]

191 [♂, present in collection *c.*1874 (Gore MS *c.*1874)]

194 young [♀, present in collection *c.*1874 (Gore MS *c.*1874)]

Seven New Zealand shovelers *Anas rhynchos variegata*

196 ad. ♂ mount

197 ad. ♂ [present in collection *c.*1874 (Gore MS *c.*1874)]

198 ad. ♂ [received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection *c.*1874 (Gore MS *c.*1874)]

199 ad. ♂

200 ad. ♀ [present in collection *c.*1874 (Gore MS *c.*1874)]

201 ad. ♀ [received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871);

present in collection *c.*1874 (Gore MS *c.*1874)]
202 juv. ♂ [present in collection *c.*1874 (Gore MS *c.*1874)]

Five New Zealand scaup *Aythya novaeseelandiae*

208 ♂ [present in collection *c.*1874 (Gore MS *c.*1874)]
209 ♀ [present in collection *c.*1874 (Gore MS *c.*1874)]
210 ♂ [present in collection *c.*1874 (Gore MS *c.*1874)]
211 ♀
212 light variety [juv., present in collection *c.*1874 (Gore MS *c.*1874)]

Five Australasian harriers *Circus approximans*

8 ad. ♂
9 ad. ♀ mount
10 very young
11 ad. [present in collection *c.*1874 (Gore MS *c.*1874)]
12 [♀, present in collection *c.*1874 (Gore MS *c.*1874)]

Six New Zealand falcons *Falco novaeseelandiae*.

Threatened
[One of the missing falcons was collected in the Kaipara district *c.*1862 (Buller 1887: 216)]
1 ad. ♂ mount [presumably the ad. ♂ shot in 1859 in the Karori hills, Wellington (Buller 1872–73: 10)]
2 ad. ♀ [collected in the South Island by Travers; present in collection *c.*1874 (Gore MS *c.*1874)].
3 juv. ♂ [♀, received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871)]
4 juv. ♀ mount
6 juv. ♂
Unnumbered

Six New Zealand quail *Coturnix novaeseelandiae*. Extinct

102 ad. ♂ South Island [present in collection *c.*1874 (Gore MS *c.*1874); this specimen was registered as a mount in the museum's A. register No. 522 between 1908 and 1923 (see Tennyson & Bartle 2008: 187)]
103 ad. ♀ South Island [present in collection *c.*1874 (Gore MS *c.*1874)]
104 juv. ♂ South Island [present in collection *c.*1874 (Gore MS *c.*1874)]
105 juv. ♀ South Island [in another hand (Hector's?) it is noted that nos 105 and 106 were exchanged back to Buller for a lesser knot from Canterbury in February 1875. This knot was collected in the South Island (Buller 1872–73: 195) during or before 1871 (see Hutton 1871: 77)]
106 ad. ♂ Province of Auckland [see also note under No. 105]
Unnumbered North Island

Three banded rails *Rallus philippensis*. Threatened

161 ad. ♂
2 unnumbered, 1 very young

Eight North Island weka *Gallirallus australis greyi*.

Threatened
147 ♂ mount
148 ♀ mount
149 ♂ [North Island, received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection *c.*1874 (Gore MS *c.*1874)]
150 ♀ [present in collection *c.*1874 (Gore MS *c.*1874)]
150^A juv.
152 partial albino [present in collection *c.*1874 (Gore MS *c.*1874)]
2 unnumbered young

Eight western weka *Gallirallus a. australis*. Threatened

153 [South Island, received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871)]
154 [present in collection *c.*1874 (Gore MS *c.*1874)]
155 [present in collection *c.*1874 (Gore MS *c.*1874)]
157 [present in collection *c.*1874 (Gore MS *c.*1874)]
159 ♂ dark phase [received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); southwest coast of Otago, present in collection *c.*1874 (Gore MS *c.*1874); see also notes under No. 160]
160 ♀ dark phase [nos 159 and 160 are presumed to be the pair referred to in Buller (1872–73: 175); these were acquired from his brother (John Buller), who bought them alive from a dealer in Dunedin in 1869]
2 unnumbered dark phase

One corncrake *Crex crex*. Straggler

167 mount [holotype of *Rallus featherstoni* Buller 1865, killed near Nelson in about 1855, from I. St John (see Tennyson & Bartle 2008); received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871)]

One spotless crane *Porzana tabuensis plumbea*.

Threatened
172 ad.

One marsh crane *Porzana pusilla*. Threatened

170 Not from New Zealand [present in collection *c.*1874 (Gore MS *c.*1874)]

Six pūkeko *Porphyrio melanotus*

- 174 [present in collection *c.*1874 (Gore MS *c.*1874)]
 175 ad
 176 ad. [present in collection *c.*1874 (Gore MS *c.*1874)]
 177 ad. [present in collection *c.*1874 (Gore MS *c.*1874)]
 179 chick [present in collection *c.*1874 (Gore MS *c.*1874)]
 180 albino [present in collection *c.*1874 (Gore MS *c.*1874)]

Three New Zealand dotterels *Charadrius obscurus*.

- Threatened
 118 ad. mount
 119 winter plumage [present in collection *c.*1874 (Gore MS *c.*1874)]
 120 summer plumage [present in collection *c.*1874 (Gore MS *c.*1874)]

Two banded dotterels *Charadrius bicinctus*. Threatened

- 121 young [present in collection *c.*1874 (Gore MS *c.*1874)]
 122 chick [present in collection *c.*1874 (Gore MS *c.*1874)]

Two wrybills *Anarhynchus frontalis*. Threatened

- 123 ♂ [present in collection *c.*1874 (Gore MS *c.*1874)]
 124 ♀ [present in collection *c.*1874 (Gore MS *c.*1874)]

One Chatham Island snipe *Coenocorypha pusilla*.

- Threatened
 146 [holotype of *Gallinago pusilla*, collected on 'a small rocky islet off Chatham Island' by Charles Traill (see Tennyson & Bartle 2008)]

Three bar-tailed godwits *Limosa lapponica*

- [One of the missing godwits may have been the 'albino' shot by Buller at the Ohau [river mouth], Horowhenua, in the spring of 1862 (Buller 1872–73: 199)]
 141 ad. ♂ mount
 142 [present in collection *c.*1874 (Gore MS *c.*1874)]
 143 [present in collection *c.*1874 (Gore MS *c.*1874)]

One long-tailed skua *Stercorarius longicaudus*? Straggler
 233 [ad., shot on a Horowhenua Beach on 30 April 1864 by Buller (Buller 1888a: 66); tail figured by Buller (1879); listed by Buller (MS 1871a) as '*Lestrís* sp.' but this specimen is now considered most likely to be *Stercorarius longicaudus* (Melville 1985); received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); examined by European bird experts Otto Finsch and Howard Saunders (Buller 1879); missing from collection by 1914 (Melville 1985)]

Two southern black-backed gulls *Larus dominicanus*

- 234 [present in collection *c.*1874 (Gore MS *c.*1874)]
 235 [received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection *c.*1874 (Gore MS *c.*1874)]

One black-billed gull *Larus bulleri*. Threatened

- 237 ♂ [received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871)]

One black-fronted tern *Sterna albobristata*. Threatened

Unnumbered

Three white-fronted terns *Sterna striata*. Threatened

- 239 [no data]
 240 young [present in collection *c.*1874 (Gore MS *c.*1874)]
 Unnumbered

Two New Zealand pigeons *Hemiphaga novaeseelandiae*.

- Threatened
 100 ♂ mount
 101 spotted variety [present in collection *c.*1874 (Gore MS *c.*1874)]

Two kākāpō *Strigops habroptilus*. Extinct on mainland

- 95 [no data]
 96 [present in collection *c.*1874 (Gore MS *c.*1874)]

Three South Island kākā *Nestor m. meridionalis*.

- Threatened
 83 [South Island, present in collection *c.*1874 (Gore MS *c.*1874)]
 84 [South Island, present in collection *c.*1874 (Gore MS *c.*1874)]
 89 [the only specimen that Buller (MS 1871a) described as *Nestor superbus*, so possibly the specimen referred to by Buller (1873–74: 41), which was collected on Banks Peninsula]

Six kākā *Nestor meridionalis* subsp. Threatened

- 85 green variety, mount
 86 scarlet variety, mount [presumably the bird referred to by Buller (1872–73: 43), which 'was obtained nearly twenty years ago in the Wanganui district']
 87 yellow variety, mount
 88 albino [presumably the 'almost pure albino' referred to by Buller 1872–73: 42); present in collection *c.*1874 (Gore MS *c.*1874)]
 92 ♀ [presumed to be a syntype of *Nestor occidentalis* Buller, 1869; collected in Fiordland by James Hector (see Appendix 1, No. 91)]
 Unnumbered canary-coloured variety, mount

One kea *Nestor notabilis*. Threatened

90 [received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection c.1874 (Gore MS c.1874)]

One red-crowned parakeet *Cyanoramphus novaezelandiae*

79 ad. ♂ mount

Two yellow-crowned parakeets *Cyanoramphus auriceps*. Threatened

80 mount

81 coloured variety [presumably the 'abnormally coloured' specimen purchased alive by Buller in the 'summer of 1863' in the Manawatu district (Buller 1872–73: 61); present in collection c.1874 (Gore MS c.1874)]

One orange-fronted parakeet *Cyanoramphus malherbi*.

Threatened

82 [presumed to be a **syntype** of *Platycercus alpinus* Buller, 1869, collected by Haast from 'forests of the Southern Alps' (see Tennyson & Bartle 2008); present in the Colonial Museum c.1874 (Gore MS c.1874)]

Three shining cuckoos *Chrysococcyx lucidus*

99^A mount

99^B juv.

Unnumbered young

Two long-tailed cuckoos *Eudynamis taitensis*.

Threatened

97 mount

98 mount

Three moreporks *Ninox novaeseelandiae*

13 ad. ♀ mount [NMNZ OR. 1340 was in the museum collection during the 1960s (Dominion Museum register) but missing by May 2008]

14 ad. ♂ [present in collection c.1874 (Gore MS c.1874)]

16 small [present in collection c.1874 (Gore MS c.1874)]

One laughing owl *Sceloglaux albifacies*. Extinct

17 ad. mount [received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871)]

Four sacred kingfishers *Halcyon sancta vagans*

18 ad.

19 juv.

2 unnumbered

One bush wren *Xenicus longipes*. Extinct

34 ad. ♂ [present in collection c.1874 (Gore MS c.1874)]

Two New Zealand pipits *Anthus novaeseelandiae*

62 [present in collection c.1874 (Gore MS c.1874)]

Unnumbered

Two fernbirds *Bowdleria punctata*. Threatened

42 [no data]

Unnumbered

One Chatham Island fernbird *Bowdleria rufescens*.

Extinct

43 [**holotype** of *Sphenoeacus rufescens*, collected on Mangere Island, Chatham Islands, by Charles Traill (see Oliver 1955; Tennyson & Bartle 2008) in 1868; Buller 1872–73: 131, figured opposite p. 128]

Three whiteheads *Mohoua albigilla*

40 ad. ♀ mount

41 ad. ♂

Unnumbered

Four yellowheads *Mohoua ochrocephala*. Threatened

37^A mount

38 ad. ♂ mount

39 ad. ♀ mount

Unnumbered mount

Five grey warblers *Gerygone igata*

44 mount

45 mount

46 juv.

2 unnumbered

Four fantails *Rhipidura fuliginosa*

68 ad.

69 juv.

2 unnumbered

One willie-wagtail *Rhipidura leucophrys*. Straggler

71 mount. [Gore MS (undated) notes a '*Rhipidura motacilloides*' (= willie-wagtail, Sharpe 1879: 340) and we presume this refers to specimen No. 71. Buller (1872–73) does not mention the willie-wagtail, and so he apparently knew that this specimen was not from New Zealand. On the other hand, Hutton (1871) reports that a specimen of '*Rhipidura motacilloides*' in the Colonial Museum was 'said to have been obtained in the Auckland Province'. There is uncertainty as to the provenance of this missing specimen]

Two North Island tomtits *Petroica macrocephala toitoi*

56 ad. ♀ mount

Unnumbered ♂

One South Island tomtit *Petroica m. macrocephala*

54 ad. ♂ [present in collection c.1874 (Gore MS c.1874)]

One tomtit *Petroica macrocephala* subsp.

58 ♂ [present in collection c.1874 (Gore MS c.1874)]

Three North Island robins *Petroica australis longipes*

61 [no data]

2 unnumbered

One South Island robin *Petroica a. australis*

59 ad. ♂ [present in collection c.1874 (Gore MS c.1874)]

Three silvereyes *Zosterops lateralis*. New colonist

49 ad. ♂ mount

50 ad. ♀ mount

51 ♂ [present in collection c.1874 (Gore MS c.1874)]

Two stitchbirds *Notiomystis cincta*. Threatened

26 ad. ♂ mount

27 ad. ♀ mount [presumably the female collected by Buller in either the Hutt Valley or Makara, Wellington, in the 1860s (Buller 1887: 104)]

Five bellbirds *Anthornis melanura*

28 ad. ♂ mount

29 ad. ♀

31 [no data]

32 [no data]

Unnumbered ♀

One Chatham Island bellbird *Anthornis melanocephala*.

Extinct

30 [juv. ♂, collected near Waitangi, Chatham Island, in 1855 by Buller, **holotype** of *Anthornis auriocula* Buller, 1865 (see Tennyson & Bartle 2008); possibly collected 1856 (Galbreath 1989: 31)]

Four tūi *Prothemadera novaeseelandiae*

23 ad. ♂ mount

24 ad. ♂

25 albino mount [presumably the 'beautiful albino' obtained 'some years ago in the Wanganui district' (Buller 1872–73: 88)]

Unnumbered

Three North Island kōkako *Callaeas wilsoni*. Threatened

72 ad. ♂ [presumably the 'fine male' shot by Buller in the 'Upper Manawatu' (Buller 1872–73: 152 and figured opposite p. 152); received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection c.1874 (Gore MS c.1874)]

73 ad. ♀ [present in collection c.1874 (Gore MS c.1874)]

Unnumbered, North Island [as this specimen was described as '*Callaeas olivascens?*' (Buller MS 1871a), it was presumably a juvenile (see Buller 1872–73: 152)]

One South Island kōkako *Callaeas cinerea*. Extinct

76 ad. ♂ [received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection c.1874 (Gore MS c.1874)]

One saddleback *Philesturnus carunculatus* or *P. rufusater*.

Threatened

78 ♂ mount

Four huia *Heteralocha acutirostris*. Extinct

[One of the missing ♀ huia was collected in the Wairarapa (Buller 1872–73: 68, figured opposite p. 63)]

20 ad. ♂ mount [presumably the ad. ♂ shot in the 'summer of 1867' in the Ruahine Ranges (Buller 1872–73: 67–68, figured opposite p. 63)]

21 ad. ♀ mount

22 juv. ♀ [received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871)]

22^A [♂ young, received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871)]

Two North Island piopio *Turnagra tanagra*. Extinct

65 [received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); see also note under No. 67]

67 [present in collection c.1874 (Gore MS c.1874); specimen nos 65 and 67 were no longer in the Colonial Museum in 1895 (Buller 1896); see also Appendix 1, No. 66)]

One South Island piopio *Turnagra capensis*. Extinct

63 ♂ [received by Buller on loan from the Colonial Museum 19 May 1871 (Buller to Hector, 19 May 1871); present in collection c.1874 (Gore MS c.1874)]

Appendix 4:

Notable specimens sold by
Buller to Rothschild 1888–92
from the 'Second Collection',
and supplementary sales

Each entry is arranged as follows:

1. Current English and scientific name, type status, and conservation status (after Hitchmough *et al.* 2007).
2. Number of specimens, their age and sex, locality and date of collection if available, collector's name if known, and registration numbers from institutions where they are kept at present.

Notes

1. Additional information, not in Buller & Rothschild MS (1888) or on label, added in square brackets. This is based on specimen examination or sourced from Buller (1887, 1888a), unless otherwise indicated.
2. ad. = adult; juv. = juvenile; imm. = immature.

Little spotted kiwi *Apteryx owenii*. Extinct on mainland 10, including 2 juv. One North Island [Mt Hector, Tararua Range] specimen [December 1875, M. Carkeek]; now NHM 1939.12.9.1480, ex Rothschild Collection

Buller's shearwater *Puffinus bulleri*. Holotype 1 ad. ♂, Waikanae River mouth, 1 October 1884; AMNH 527592

King penguin *Aptenodytes patagonicus*. Straggler 1 ad. ♂, Stewart Island

Yellow-eyed penguin *Megadyptes antipodes*. Threatened 7, including 1 young

Erect-crested penguin *Eudyptes sclateri*. Syntype 1 ad. ♂, Auckland Islands; AMNH 525790 (Greenway 1973: 215)

Auckland Island shag *Leucocarbo colensoi*. Lectotype 1 ad. ♂ [contra Hartert (1925: 273)], Auckland Islands, 1885 [Burton]; AMNH 730048

New Zealand little bittern *Ixobrychus novaezelandiae*. Extinct 1 ad. ♂ and 1 ♀ [Hokitika, May 1871]. These specimens were not found in the AMNH or NHM in 1980–82 and thus may be lost

Brown teal *Anas chlorotis*. Threatened 4 ad., including 2 from Dusky Sound [coll. Reischek (Buller 1888a: 258)]

Auckland Island merganser *Mergus australis*. Extinct 1 ad. ♂, Auckland Islands

New Zealand quail *Coturnix novaezelandiae*. Extinct 4, including 1 juv., Kaiapoi, 1859 [Buller], Whangarei, 1860 [Mair], Canterbury, 1861 [Haast]

Grey ternlet *Procelsterna cerulea*. New colonist [The first New Zealand record, shot at Cape Maria van Diemen in early 1882 by lighthouse-keeper C.H. Robson (Buller 1888a: 78). Incorrectly listed by Buller in the sales catalogue (Buller & Rothschild MS 1888) as from Portland Island, where Robson was posted the following year]

Kākāpō *Strigops habroptilus*. Extinct on mainland 13, including 5 ♀ and 2 juv. One from the 'Southern Alps'. Rothschild added 1 specimen from Milford Sound and 3, including 1 juv., from Jackson's Bay [coll. C. Robinson]

Orange-fronted parakeet *Cyanoramphus malherbi*. Threatened 1 ad. ♂ and 1 ♀

Laughing owl *Sceloglaux albifacies*. Extinct 7, including 2 mounted birds and 1 chick [probably all from Albury, near Timaru, 1881, W.W. Smith (Buller 1887: 201)]

Fork-tailed swift *Apus pacificus*. Straggler, only New Zealand specimen then known 1 ad. [Whitecliffs, New Plymouth, December 1884, W.B. Messenger (Buller 1887: 116)]

South Island bush wren *Xenicus l. longipes*. Extinct 6, including 1 juv. from Dusky Sound [coll. by Reischek?]

Welcome swallow *Hirundo tahitica neoxena*. New colonist, the third New Zealand specimen 1 ad. ♀ [Opawa River, near Blenheim, 9 June 1878, J.R.W. Cook (Buller 1887: 75)]

New Zealand robin *Petroica australis* 8, including specimens from Little Barrier Island and the Forty-mile Bush, near Eketahuna, North Island

Silvereye *Zosterops lateralis*. New colonist 6

Chatham Island bellbird *Anthornis melanocephala*.

Extinct

4, including 2 juv.

South Island saddleback *Philesturnus carunculatus*.

Extinct on mainland

12, including 1 imm.: 2 from the Taipo River, near Otira [1873 and 1875], 1 from Banks Peninsula, and 1 probably from Catlins, Otago

Huia *Heteralocha acutirostris*. Extinct

8, including 2 juv.

North Island piopio *Turnagra tanagra*. Extinct

3, including 1 juv.

South Island piopio *Turnagra capensis*. Extinct

4, including 1 juv.

Appendix 5:

Selected ‘*Third Collection*’ specimens from the Carnegie Museum of Natural History

Each entry is arranged as follows:

1. Current English and scientific name, and conservation status (after Hitchmough *et al.* 2007).
2. Number of specimens, their age and sex, locality and date of collection if available, type status and collector’s name if known, Carnegie Museum registration numbers.

Notes

1. Additional information, not on label, is added in square brackets. This is based on specimen examination or sourced from Buller (1905, 1906), unless otherwise indicated.
2. ad. = adult; juv. = juvenile; imm. = immature.

South Island brown kiwi *Apteryx a. australis*. Threatened
3 ad., Otago, 1891 [W. Smyth?]; CMNH 24195–7

Stewart Island brown kiwi *Apteryx australis lawryi*
6 ad., Stewart Island, 1896 [O. Marklund]; CMNH
24198–203

Little spotted kiwi *Apteryx owenii*. Extinct on mainland
6, including 1 juv.: 3 from South Island 1892; 1 from South
Island West Coast 1892; 1 juv. from Jackson Bay, South

Westland 1892; 1 ad. ♂ from Buller River 1895 [J. Brough?];
CMNH 24215–9, 24222

Flesh-footed shearwater *Puffinus carneipes*. Not breeding
at this locality

2, Mokohinau Island, 1892, Reeves (lighthouse-keeper);
CMNH 24310, 24311

Buller’s shearwater *Puffinus bulleri*

[Unlabelled **holotype** of *Puffinus zealandicus* Sandager, 1890
(Buller 1905: 101)]

1, Mokohinau Island, [January 1886] 1889; CMNH 24302

Black petrel *Procellaria parkinsoni*. Extinct on mainland
2, spurs above Heaphy River, December 1892, C. Robinson
(Buller 1905: 28); CMNH 24318–9

White-naped petrel *Pterodroma cervicalis*. No longer
breeding at this locality

4: 3 ad. and 1 chick, [Raoul Island] Kermadec group, 1892–
95 [A.W. Bethune?], [discussed by Buller (1905: 114)];
CMNH 24327–30

Kermadec petrel *Pterodroma n. neglecta*. No longer
breeding at this locality

8 ad., [Raoul Island] Kermadec group, 1890–95 [A.W.
Bethune?], [discussed by Buller (1905: 115)]; CMNH
24331–8

Pycroft’s petrel *Pterodroma pycrofti*

1 ad. ♀, Hauraki Gulf, 1897; CMNH 24342

Macaroni penguin *Eudyptes c. chrysolophus*. Straggler

1 ♂ [more likely ♀, based on size], Macquarie Island, 1897;
CMNH 24293

Lesser frigatebird *Fregata ariel*. Straggler

1 ♀ [recorded incorrectly on label as ♂ (Buller 1906: 50)],
Cape Farewell [15 April 1901, Captain Fairchild (Buller
1906: 50)]; CMNH 24551

Pied shag *Phalacrocorax varius*. New locality

1 ad. ♂, Auckland Islands, 1896; CMNH 24516

Little black shag *Phalacrocorax sulcirostris*. New colonist

2, [Waitangi River] Bay of Islands, [July] 1897 [A.T. Pycroft
(Buller 1906: 41)]; CMNH 24538–9

King shag *Leucocarbo carunculatus*. Threatened

2 ad., [White Rocks] Queen Charlotte Sound, [July] 1892
(Buller 1906: 26); CMNH 24517–8.

Chatham Island shag *Leucocarbo onslowi*. Threatened
2 ad., Chatham Islands, 1898; CMNH 24521–2

Pitt Island shag *Stictocarbo featherstoni*. Threatened
2, Chatham Islands, 1892; CMNH 24536–7

Oriental grey heron *Ardea cinerea jouyi*. Straggler
1 first-year bird, off East Coast of New Zealand, 1898
(Parkes 1974); CMNH 24467

Nankeen night heron *Nycticorax caledonicus*. Straggler
1 ♀, Westland, 1860s; CMNH 24474

New Zealand little bittern *Ixobrychus novaeseelandiae*.
Extinct
1 ad. ♀, South Island, 1891; CMNH 24475

Brown teal *Anas chlorotis*. Threatened
1 ad. ♀ and 1 partially white ad. ♂ (Buller 1906: 12), the
latter apparently incorrectly labelled 'Otago', Manawatu,
1892 [G. Mair]; CMNH 24491–2

Blue duck *Hymenolaimus malacorhynchus*. Threatened
2 ad., Upper Pelorus [River, Marlborough], 1892
[J. Brough]; CMNH 24506–7

Auckland Island merganser *Mergus australis*. Extinct
1 ad. ♂, Auckland Islands, 1894 [A.W. Bethune?]; CMNH
24509

New Zealand falcon *Falco novaeseelandiae*. Threatened
5 ad. and 2 juv.: 4 from Ohinetahi, Governors Bay, Banks
Peninsula, 1870; CMNH 24561–7

New Zealand quail *Coturnix novaeseelandiae*. Extinct
3 ad. [island in Blueskin Bay, just north of Dunedin, c.1867,
A.C. Purdie (Buller 1905: 35)]; CMNH 24223–5

Chatham Island rail *Cabalus modestus*. Extinct
2 ad., Mangere Island, Chatham Islands, 1891 [W. Hawkins
(Buller 1905: 45)]; CMNH 24269–70. [Spurs on the carpal
flexure of the wings are 1.8 mm in length]

North Island weka *Gallirallus australis greyi*. Threatened
6 ad.: 4 from the Rangitikei district [R.A. Wilson (Buller
1905: 48)]; 2 from Wellington [Horowhenua], 1892;
CMNH 24246–51

Buff weka *Gallirallus australis hectori*. Extinct on
mainland
6: 2 from Waimate, South Canterbury, 1897; 3 from Otago,
1891–92; CMNH 24258–9, 24260–1, 24264

Variable oystercatcher *Haematopus unicolor*. New
locality; new breeding site
1 partly downy fledgling, Snares Islands, 1892; CMNH
24424

Red-necked avocet *Recurvirostra novaehollandiae*. New
record, straggler
1 ad. ♀, Marlborough, 1874; CMNH 24444

Southern New Zealand dotterel *Charadrius o. obscurus*.
Threatened
1 ad. ♂, [700 m] Stewart Island, 1895 [Marklund] (Buller
1905: 175); CMNH 24426

Greenshank *Tringa nebularia*. New record, straggler
1 ♂, Otago, 1888; CMNH 24550

South Island kākā *Nestor m. meridionalis*. Threatened
and extinct east of Southern Alps
2 ad. ♂: 1 from Kaikoura, November 1892; 1 from Catlins,
Otago, 1897; CMNH 24579, 24583

Kākāpō *Strigops habroptilus*. Extinct on mainland
5 ad., 0 juv.: 1 ♂ and 1 ♀ from Milford Sound, 1891 and
1892; 1 ♂ from [west] Otago, 1891; 1 ♂ from West Coast,
1895; 1 mounted ♂ [by size] from South Island, no date;
CMNH 24573–6, 24194

Orange-fronted parakeet *Cyanoramphus malherbi*.
Threatened
2 from Otago, 1892; CMNH 24595–6

Laughing owl *Sceloglaux albifacies*. Extinct
2 ad. from Otago, 1895 and 1903; plus 1 ad. ♂ from Blue-
skin Bay [Otago], May 1874 [not 1894 as labelled]
[W. Smyth], (Buller 1906: 64); CMNH 24568–70

Tawny owl *Strix aluco*. Failed introduction
1 [ad., Wellington, March] 1896 [A. Turnbull (Buller 1905:
xlii)]; CMNH 24572

South Island bush wren *Xenicus l. longipes*. Extinct
8 ad.: 1 from the South Island, 1892; 4 from the [upper]
Karamea [River], 1895 [J. Brough]; 2 from the 'Nelson
Mountains' [= upper Karamea River], 1896 [J. Brough]; 1
from the 'Tasman Mountains' [= upper Karamea River],
1899 [J. Brough] (Buller 1905: 104); [empty nests recorded
by Brough (Newport 1962: 240, 405)]; CMNH 24630–7

Rock wren *Xenicus gilviventris*. Threatened
1 ad. ♂, 'Nelson Mountains' [probably Mt Kendall, upper
Karamea River (Buller 1906: 109; Newport 1962: 240)],
1896 [J. Brough]; CMNH 24638

Stephens Island wren *Traversia lyalli*. Extinct

1 ad. ♀, Stephens Island, 1894 [D. Lyall]; CMNH 24639

Chatham Island fernbird *Bowdleria rufescens*. Extinct

3 ad.: Chatham Islands, 1 from 1891 and 2 undated [1 purchased in London (Buller 1906: 133)]; CMNH 24736–8. [Rothschild received 12 specimens from his collector Henry Palmer in November 1890 (Buller & Rothschild MS 1888), and this species was extinct by about 1892 (Tennyson & Martinson 2007)]

Yellowhead *Moboua ochrocephala*. Threatened

6 ad.: 2 from ‘Otago District’, 1892 [W. Smyth]; 4 from ‘Pelorus Woods’ [= Pelorus River, Marlborough], 1894 [J. Brough]. CMNH 24724–9. [This species no longer occurs naturally in Marlborough, but persists in small numbers in eastern Otago (Robertson *et al.* 2007)]

North Island robin *Petroica australis longipes*. Locally

extinct in Auckland

3 ad., including two from Auckland, 1886 and 1888; CMNH 24655–7

Chatham Island bellbird *Anthornis melanocephala*.

Extinct

4 ad., Chatham Islands, 1892 (2) [W. Hawkins?], 1897 (1), 1898(1); CMNH 24704–7

Red wattlebird *Anthochaera carunculata*. Straggler

1 ad., Rahoitu Camp (Taranaki), 1892 [collected by Mr Avery (Buller 1887:107)]; CMNH 24694. [This specimen is more reliably documented than the pre-1855 specimen listed in Appendix 1, the New Zealand origin of which Buller (1887) had begun to doubt]

North Island kōkako *Callaeas wilsoni*. Threatened

2 ad., including 1 from the Tararua Range, 1892; CMNH 24780–1

South Island kōkako *Callaeas cinerea*. Extinct

1 ad. from Nelson and 1 from Otago, 1892; CMNH 24778–9

South Island saddleback *Philesturnus carunculatus*.

Extinct on mainland

12, including 3 juv.: notably 3 from the ‘Otago District’, 1891 and 1892 [W. Smyth]; 2 from Stephens Island, 1892 [collected by H.H. Travers (Medway 2004a: 203), contra Medway (2004a: 205) these birds are not catalogued ‘February 1892’, which would have been before work on the lighthouse began and before Travers’ first visit]; 1 from

‘Nelson’, 1892; 2 from Canterbury, 1892; 1 from [the upper] Karamea [River], 1895 [J. Brough]; 1 from Preservation Inlet February 1896; CMNH 24760–71

Huia *Heteralocha acutirostris*. Extinct

6, including 1 juv.: 3 from the Puketoi Range; 1 from the Ngarara Range; 2 from the Makuri Range [eastern Wairarapa–Southern Hawke’s Bay districts]. All collected in 1892 (one given as February, another as 28 November); CMNH 24772–7

North Island piopio *Turnagra tanagra*. Extinct

1 ad. ♀, Hunterville [district], 1890; CMNH 24757. [Buller (1906: 134) says he received only one other specimen after 1888 from the Makuri Range, northern Wairarapa, but he refers to other reliable records from the early 1890s from upper Wanganui River east to the Puketoi Range, northern Wairarapa]

South Island piopio *Turnagra capensis*. Extinct

2 ad., 3 imm.: 1 ad. ♂, Lake McKerrow, Fiordland, September 1894; 1 imm. ♂, Stephens Island, Cook Strait, 1894 [D. Lyall?], the **holotype** of *Turnagra capensis minor* Fleming, 1915; 1 imm. ♀, Stephens Island, Cook Strait, 1895 [D. Lyall?]; 1 ad. ♀ from the ‘Otago District’, 1895 [W. Smyth?]; 1 imm. ♀ from ‘South Island’, no date; CMNH 24752–6