



NEW ZEALAND THREAT CLASSIFICATION SERIES 12

Conservation status of New Zealand fleas, 2014

Allen C.G. Heath, Ian Stringer, Rod Hitchmough and Jeremy Rolfe

Cover: Female *Notiopsylla kerguelensis kerguelensis* from the nest of *Diomedea melanophris impavida* (now *Thalassarche impavida*) in Campbell Island/Motu Ihupuku, collected on 2 December 1975. Photo: Allen Heath.

New Zealand Threat Classification Series is a scientific monograph series presenting publications related to the New Zealand Threat Classification System (NZTCS). Most will be lists providing NZTCS status of members of a plant or animal group (e.g. algae, birds, spiders). There are currently 23 groups, each assessed once every 5 years. After each five-year cycle there will be a report analysing and summarising trends across all groups for that listing cycle. From time to time the manual that defines the categories, criteria and process for the NZTCS will be reviewed. Publications in this series are considered part of the formal international scientific literature.

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Abstract

The conservation status of all 33 New Zealand flea taxa was assessed using the New Zealand Threat Classification System (NZTCS), with all fleas assigned the same threat status as their least-threatened host species. Three species are ranked as Data Deficient, 1 Threatened (Nationally Vulnerable), 9 At Risk, 9 Not Threatened and 11 Introduced and Naturalised. A full list is presented, along with a statistical summary and brief notes. This is the first time the threat status of any flea found in New Zealand has been assessed.

Keywords: New Zealand Threat Classification System, NZTCS, conservation status, Siphonaptera, flea.

1. Summary

The conservation status of all fleas known to be present in New Zealand was assessed using the New Zealand Threat Classification System (NZTCS) criteria (Townsend et al. 2008). This is the first time the New Zealand conservation status of any flea found in New Zealand has been assessed. All fleas were assigned the conservation status of their least threatened hosts (Townsend et al. 2008) because there is insufficient information on their infestation frequencies to assign them to more threatened categories. The fauna includes 33 taxa comprising 27 species and 12 subspecies of which 11 taxa are introduced and naturalised, four are non-endemic natives, 17 are endemic and the endemicity of one (*Hoogstraalia imberbis* Smit, 1979) is uncertain (Macfarlane et al. 2010). All four non-endemic native taxa are ranked as Not Threatened, whereas three endemic species are Data Deficient and one endemic flea (*Porribus pacificus* Jordan, 1946) which occurs on bats is Threatened (Tables 1 and 2). The remaining taxa are ranked as At Risk (9) or Not Threatened (5). Two of the fleas known from a single location (*Notiopsylla corynetes* Smit, 1979; *Parapsyllus lynnae alynnae* Smit 1979) parasitise Hutton's shearwater (*Puffinus huttoni* Mathews, 1912) whereas the other flea known from one location (*Parapsyllus nestoris antichthones* Smit, 1979) has been found only on parakeets on main Antipodes Island, although prions occasionally introduce individual fleas to islets to the north of Antipodes Island (Smit 1979). Range Restricted fleas comprise *Notiopsylla peregrinus* Smit, 1979 which is restricted to the Snares Islands, *Parapsyllus lynnae lynnae* Smit, 1979 which is known only from birds that breed on the Snares and islands around Stewart Island, and two others, *Parapsyllus lynnae mariae* Smit, 1979 and *Parapsyllus mangarensis* Smit, 1979, found only on the Chatham Islands (Smit 1979). To fully assess the conservation status of the fleas reported here, host records additional to those found in Smit (1979) were obtained from Bishop & Heath (1998) and Heath (2010a, b).

Table 1. Statistical summary of the status of New Zealand flea taxa.

CATEGORY	TOTAL 2014
Data Deficient	3
Threatened—Nationally Vulnerable	1
At Risk—Declining	2
At Risk—Relict	1
At Risk—Naturally Uncommon	6
Not Threatened	9
Introduced and Naturalised	11
Total	33

2. Conservation status of all known New Zealand fleas

Table 2 provides details of all known New Zealand fleas. Taxa are assessed according to the criteria of Townsend et al. (2008), arranged by threat category and then alphabetically by scientific name.

Table 2. New Zealand flea taxa assessed according to the criteria of Townsend et al. (2008), arranged by threat category and then alphabetically by scientific name.

NAME AND AUTHORITY, LISTED BY CATEGORY	FAMILY	TAXONOMIC STATUS	CRITERIA*	QUALIFIERS*
Data Deficient*				
<i>Hoogstraalia imberbis</i> Smit, 1979	Pygiopsyllidae	Determinate		
<i>Parapsyllus mangarensis</i> Smit, 1979	Rhopalopsyllidae	Determinate		
<i>Parapsyllus valedictus</i> Smit, 1979	Rhopalopsyllidae	Determinate		
Threatened—Nationally Vulnerable				
<i>Porribus pacificus</i> Jordan, 1946	Ischnopsyllidae	Determinate	E(2/1)	
Declining				
<i>Notiopsylla corynetes</i> Smit, 1979	Pygiopsyllidae	Determinate	C(1/1)	
<i>Parapsyllus lynnae alynnae</i> Smit 1979	Rhopalopsyllidae	Determinate	A(2/1)	
Relict				
<i>Notiopsylla enciari regula</i> Smit, 1979	Pygiopsyllidae	Determinate	B	
Naturally Uncommon				
<i>Notiopsylla kerguelensis tenuata</i> Smit, 1979	Pygiopsyllidae	Determinate		
<i>Notiopsylla peregrinus</i> Smit, 1979	Leptopsyllidae	Determinate		
<i>Parapsyllus lynnae lynnae</i> Smit, 1965	Rhopalopsyllidae	Determinate		RR
<i>Parapsyllus lynnae mariae</i> Smit, 1979	Rhopalopsyllidae	Determinate		RR
<i>Parapsyllus magellanicus largificus</i> Smit, 1984	Rhopalopsyllidae	Determinate		
<i>Parapsyllus nestoris antichthones</i> Smit, 1979	Rhopalopsyllidae	Determinate		OL
Not Threatened				
<i>Notiopsylla enciari enciari</i> Smit, 1957	Pygiopsyllidae	Determinate		
<i>Notiopsylla kerguelensis kerguelensis</i> (Taschenberg, 1880)	Pygiopsyllidae	Determinate		
<i>Pagipsylla galliralli</i> (Smit, 1965)	Pygiopsyllidae	Determinate		
<i>Parapsyllus cardinis</i> Dunnet, 1961	Rhopalopsyllidae	Determinate		
<i>Parapsyllus jacksoni</i> Smit, 1965	Rhopalopsyllidae	Determinate		
<i>Parapsyllus longicornis</i> (Enderlein, 1901)	Rhopalopsyllidae	Determinate		
<i>Parapsyllus magellanicus</i> Jordan, 1938	Rhopalopsyllidae	Determinate		
<i>Parapsyllus nestoris nestoris</i> Smit, 1965	Rhopalopsyllidae	Determinate		
<i>Parapsyllus struthophilus</i> Smit, 1979	Rhopalopsyllidae	Determinate		
Introduced and Naturalised				
<i>Ceratophyllus (Ceratophyllus) gallinae</i> (Schrank, 1803)	Ceratophyllidae	Determinate		
<i>Ctenocephalides canis</i> (Curtis, 1826)	Pulicidae	Determinate		
<i>Ctenocephalides felis felis</i> (Bouché, 1835)	Pulicidae	Determinate		
<i>Leptopsylla (Leptopsylla) segnis</i> (Schönherr, 1811)	Leptopsyllidae	Determinate		
<i>Nosopsyllus (Nosopsyllus) fasciatus</i> (Bosc, 1800)	Ceratophyllidae	Determinate		
<i>Nosopsyllus (Nosopsyllus) londiniensis</i> (Rothschild, 1903)	Ceratophyllidae	Determinate		
<i>Pulex (Pulex) irritans</i> Linnaeus, 1758	Pulicidae	Determinate		
<i>Pygiopsylla hoplia</i> Jordan & Rothschild, 1922	Pygiopsyllidae	Determinate		
<i>Pygiopsylla phiola</i> Smit, 1979	Pygiopsyllidae	Determinate		
<i>Xenopsylla cheopis</i> (Rothschild, 1903)	Pulicidae	Determinate		
<i>Xenopsylla vexabilis</i> Jordan, 1925	Pulicidae	Determinate		

*See Townsend et al. (2008) for details of categories, criteria and qualifiers. Qualifiers are abbreviated as follows:

CD	Conservation Dependent
De	Designated
DP	Data Poor
EF	Extreme Fluctuations
EW	Extinct in the Wild
IE	Island Endemic
Inc	Increasing
OL	One Location
PD	Partial Decline
RF	Recruitment Failure
RR	Range Restricted
SO	Secure Overseas
S?O	Uncertainty as to whether the overseas taxon is secure
Sp	Sparse
St	Stable
TO	Threatened Overseas

Data Deficient

Taxa that are suspected to be threatened, or in some instances, possibly extinct but are not definitely known to belong to any particular category due to a lack of current information about their distribution and abundance. It is hoped that listing such taxa will stimulate research to find out the true category (for a fuller definition see Townsend et al. 2008).

Threatened

Taxa that meet the criteria specified by Townsend et al. (2008) for the categories Nationally Critical, Nationally Endangered and Nationally Vulnerable.

Nationally Critical

A—very small population (natural or unnatural)

B—small population (natural or unnatural) with a high ongoing or predicted decline

C—population (irrespective of size or number of subpopulations) with a very high ongoing or predicted decline (>70%)

Nationally Endangered

A—small population (natural or unnatural) that has a low to high ongoing or predicted decline

B—small stable population (unnatural)

C—moderate population and high ongoing or predicted decline

Nationally Vulnerable

A—small, increasing population (unnatural)

A(1/1) 250–1000 mature individuals, predicted increase >10%

A(2/1) ≤5 subpopulations, ≤300 mature individuals in the largest subpopulation, predicted increase >10%

A(3/1) Total area of occupancy ≤10 ha (0.1 km²), predicted increase >10%

B—moderate, stable population (unnatural)

B(1/1) 1000–5000 mature individuals, stable population

B(2/1) ≤15 subpopulations, ≤500 mature individuals in the largest subpopulation, stable population

B(3/1) Total area of occupancy ≤100 ha (1 km²), stable population

C—moderate population, with population trend that is declining

C(1/1) 1000–5000 mature individuals, predicted decline 10–50%

C(2/1) ≤15 subpopulations, ≤500 mature individuals in the largest subpopulation, predicted decline 10–50%

C(3/1) Total area of occupancy ≤100 ha (1 km²), predicted decline 10–50%

D—moderate to large population and moderate to high ongoing or predicted decline

D(1/1) 5000–20 000 mature individuals, predicted decline 30–70%

D(2/1) ≤15 subpopulations, ≤1000 mature individuals in the largest subpopulation, predicted decline 30–70%

D(3/1) Total area of occupancy ≤1000 ha (10 km²), predicted decline 30–70%

E—large population and high ongoing or predicted decline

E(1/1) 20 000–100 000 mature individuals, predicted decline 50–70%

E(2/1) Total area of occupancy ≤10 000 ha (100 km²), predicted decline 50–70%

At Risk

Taxa that meet the criteria specified by Townsend et al. (2008) for Declining, Recovering, Relict and Naturally Uncommon.

Declining

A—moderate to large population and low ongoing or predicted decline

A (1/1) 5000–20 000 mature individuals, predicted decline 10–30%

A (2/1) Total area of occupancy ≤1000 ha (10 km²), predicted decline 10–30%

B—large population and low to moderate ongoing or predicted decline

B (1/1) 20 000–100 000 mature individuals, predicted decline 10–50%

B (2/1) Total area of occupancy ≤10 000 ha (100 km²), predicted decline 10–50%

C—very large population and low to high ongoing or predicted decline

C (1/1) >100 000 mature individuals, predicted decline 10–70%

C (2/1) Total area of occupancy >10 000 ha (100 km²), predicted decline 10–70%

Recovering

Taxa that have undergone a documented decline within the last 1000 years and now have an ongoing or predicted increase of >10% in the total population or area of occupancy, taken over the next 10 years or three generations, whichever is longer. Note that such taxa that are increasing but have a population size of <1000 mature individuals (or total area of occupancy of <10 ha) are listed in one of the Threatened categories, depending on their population size (for more details see Townsend et al. (2008)).

Relict

Taxa that have undergone a documented decline within the last 1000 years, and now occupy <10% of their former range and meet one of the following criteria:

A 5000–20 000 mature individuals; population stable (±10%)

B >20 000 mature individuals; population stable or increasing at >10%

The range of a relictual taxon takes into account the area currently occupied as a ratio of its former extent. Relict can also include taxa that exist as reintroduced and self-sustaining populations within or outside their former known range (for more details see Townsend et al. (2008)).

Naturally Uncommon

Taxa whose distribution is confined to a specific geographical area or which occur within naturally small and widely scattered populations, where this distribution is not the result of human disturbance.

Not Threatened

Resident native taxa that have large, stable populations.

Introduced and Naturalised

Taxa that have become naturalised in the wild after being deliberately or accidentally introduced into New Zealand by human agency.

For fuller definitions of conservation status, see Townsend et al. 2008.

3. References

- Bishop, D.M.; Heath, A.C.G. 1998: Checklist of ectoparasites of birds in New Zealand. *Surveillance* 25 (special issue): 13–31.
- Heath, A.C.G. 2010a: Checklist of ectoparasites of birds in New Zealand: additions and corrections. *Surveillance* 37: 12–17.
- Heath, A.C.G. 2010b: A review of ectoparasites of *Apteryx* spp. (kiwi) in New Zealand, with new host records, and the biology of *Ixodes anatis* (Acari: Ixodidae). *Tuhinga* 21: 147–159.
- Macfarlane, R.P.; Maddison, P.A.; Andrew, I.G.; Berry, J.A.; Johns, P.M.; Hoare, R.J.B.; Larivière, M.-C.; Greenslade, P.; Hendsen, R.C.; Smithers, C.N.; Palma, R.L.; Ward, J.B.; Pilgrim, R.L.C.; Towns, D.R.; McLellan, I.; Teulon, D.A.J.; Hitchings, T.R.; Eastop, V.F.; Martin, N.A.; Fletcher, M.J.; Stufkens, M.A.W.; Dale, P.J.; Burckhardt, D.; Buckley, T.R.; Trewick, S.A. 2010: Phylum Arthropoda Subphylum Hexapoda: Protura, springtails, Diplura, and insects. Pp. 233–467 in: Gordon, D.P. (Ed.): New Zealand Inventory of Biodiversity, Vol 2. Canterbury University Press, Christchurch.
- Smit, F.G.A. 1979: The fleas of New Zealand (Siphonaptera). *Journal of the Royal Society of New Zealand* 9: 143–232.
- Townsend, A.J.; de Lange, P.J.; Duffy, C.A.J.; Miskelly, C.M.; Molloy, J.; Norton, D.A. 2008: New Zealand Threat Classification System manual. Department of Conservation, Wellington. 35 p.