

Taxon: Hypolepis dicksonioides (Endl.) Hook.	Family: Dennstaedtiaceae
Common Name(s): giant hypolepis ground fern	Synonym(s): Cheilanthes dicksonioides Endl. Cheilanthes pellucida Colenso Hypolepis endlicheriana C.Presl Hypolepis hawaiiensis (misidentified)

Assessor: Chuck Chimera	Status: Assessor Approved	End Date: 10 Nov 2022
WRA Score: 14.0	Designation: H(HPWRA)	Rating: High Risk

Keywords: Short-Lived Fern, Naturalized, Thicket-Forming, Rhizomatous, Wind-Dispersed

Qsn #	Question	Answer Option	Answer
101	Is the species highly domesticated?	y=-3, n=0	n
102	Has the species become naturalized where grown?		
103	Does the species have weedy races?		
201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
202	Quality of climate match data	(0-low; 1-intermediate; 2-high) (See Appendix 2)	High
203	Broad climate suitability (environmental versatility)	y=1, n=0	y
204	Native or naturalized in regions with tropical or subtropical climates	y=1, n=0	y
205	Does the species have a history of repeated introductions outside its natural range?	y=-2, ?=-1, n=0	n
301	Naturalized beyond native range	y = 1*multiplier (see Appendix 2), n= question 205	y
302	Garden/amenity/disturbance weed	n=0, y = 1*multiplier (see Appendix 2)	y
303	Agricultural/forestry/horticultural weed		
304	Environmental weed		
305	Congeneric weed	n=0, y = 1*multiplier (see Appendix 2)	y
401	Produces spines, thorns or burrs	y=1, n=0	n
402	Allelopathic		
403	Parasitic	y=1, n=0	n
404	Unpalatable to grazing animals		
405	Toxic to animals	y=1, n=0	n
406	Host for recognized pests and pathogens		
407	Causes allergies or is otherwise toxic to humans	y=1, n=0	n
408	Creates a fire hazard in natural ecosystems	y=1, n=0	n

Qsn #	Question	Answer Option	Answer
409	Is a shade tolerant plant at some stage of its life cycle		
410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	y=1, n=0	n
411	Climbing or smothering growth habit	y=1, n=0	n
412	Forms dense thickets	y=1, n=0	y
501	Aquatic	y=5, n=0	n
502	Grass	y=1, n=0	n
503	Nitrogen fixing woody plant	y=1, n=0	n
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	y=1, n=0	n
601	Evidence of substantial reproductive failure in native habitat	y=1, n=0	n
602	Produces viable seed	y=1, n=-1	y
603	Hybridizes naturally	y=1, n=-1	y
604	Self-compatible or apomictic		
605	Requires specialist pollinators	y=-1, n=0	n
606	Reproduction by vegetative fragmentation	y=1, n=-1	y
607	Minimum generative time (years)		
701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)		
702	Propagules dispersed intentionally by people	y=1, n=-1	y
703	Propagules likely to disperse as a produce contaminant	y=1, n=-1	y
704	Propagules adapted to wind dispersal	y=1, n=-1	y
705	Propagules water dispersed	y=1, n=-1	y
706	Propagules bird dispersed	y=1, n=-1	n
707	Propagules dispersed by other animals (externally)	y=1, n=-1	n
708	Propagules survive passage through the gut	y=1, n=-1	n
801	Prolific seed production (>1000/m ²)	y=1, n=-1	y
802	Evidence that a persistent propagule bank is formed (>1 yr)		
803	Well controlled by herbicides		
804	Tolerates, or benefits from, mutilation, cultivation, or fire		
805	Effective natural enemies present locally (e.g. introduced biocontrol agents)		

Supporting Data:

Qsn #	Question	Answer
101	Is the species highly domesticated?	n
	Source(s)	Notes
	Brownsey, P.J. & Perrie, L.R. (2018): Dennstaedtiaceae . In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 19. Manaaki Whenua Press, Lincoln	[Not domesticated] "Hypolepis dicksonioides occurs on Raoul, Macauley and South Meyer Islands in the Kermadec Islands. In the North Island it occurs mostly in coastal and lowland sites from Te Kao, Aupori Ecological District, to Auckland, and in scattered localities from the Bay of Plenty to Wellington. It occurs at higher elevations around thermal areas from Rotorua to Taupō, and reaches 750 m near Wairakei. In the South Island it occurs only in coastal areas of north-west Nelson and the Marlborough Sounds. It has also been recorded from the Chatham Islands. Also Norfolk Island, Samoa, Cook Islands, Tahiti and Marquesas Islands (Brownsey 1987; Sykes 2016). It is naturalised in South Australia (Brownsey 1998)."

102	Has the species become naturalized where grown?	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	NA

103	Does the species have weedy races?	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	NA

201	Species suited to tropical or subtropical climate(s) - If island is primarily wet habitat, then substitute "wet tropical" for "tropical or subtropical"	High
	Source(s)	Notes
	Brownsey, P.J. & Perrie, L.R. (2018): Dennstaedtiaceae . In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 19. Manaaki Whenua Press, Lincoln	"Hypolepis dicksonioides occurs on Raoul, Macauley and South Meyer Islands in the Kermadec Islands. In the North Island it occurs mostly in coastal and lowland sites from Te Kao, Aupori Ecological District, to Auckland, and in scattered localities from the Bay of Plenty to Wellington. It occurs at higher elevations around thermal areas from Rotorua to Taupō, and reaches 750 m near Wairakei. In the South Island it occurs only in coastal areas of north-west Nelson and the Marlborough Sounds. It has also been recorded from the Chatham Islands. Also Norfolk Island, Samoa, Cook Islands, Tahiti and Marquesas Islands (Brownsey 1987; Sykes 2016). It is naturalised in South Australia (Brownsey 1998)."

Qsn #	Question	Answer
202	Quality of climate match data	High
	Source(s)	Notes
	Brownsey, P.J. & Perrie, L.R. (2018): Dennstaedtiaceae . In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 19. Manaaki Whenua Press, Lincoln	"Distribution: North Island: Northland, Auckland, Volcanic Plateau, Gisborne, Taranaki, Southern North Island. South Island: Western Nelson, Sounds-Nelson. Kermadec Islands, Chatham Islands." ... "Also Norfolk Island, Samoa, Cook Islands, Tahiti and Marquesas Islands (Brownsey 1987; Sykes 2016). It is naturalised in South Australia (Brownsey 1998)."

203	Broad climate suitability (environmental versatility)	y
	Source(s)	Notes
	Brownsey, P. J. (1987). A review of the fern genus <i>Hypolepis</i> (Dennstaedtiaceae) in the Malesian and Pacific regions. <i>Blumea</i> , 32(2), 227-276	" <i>Hypolepis dicksonioides</i> has a disjunct distribution with lowland populations occurring on the temperate and subtropical islands of New Zealand, the Kermadecs and Norfolk Island, and higher altitude populations on the tropical islands of Samoa, Tahiti and the Marquesas group. In the temperate part of its range it is largely confined to coastal regions preferring sandy soils or disturbed ground on forest margins. In both New Zealand and the Kermadecs it occurs away from coastal areas only on thermally heated ground where it grows well in pumice soils, whilst on the more northerly Norfolk Island it grows up to 200-300 m on Mt Bates. In the tropical Pacific <i>H. dicksonioides</i> grows mostly above about 1000 m, usually on tracksides and in open situations, although sometimes in forest. On Savaii it has been recorded from lava fields. The absence of high ground above 1000 m on many tropical Pacific islands is an obvious factor limiting the distribution of this species."
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 9 Nov 2022]	"Indigenous. Kermadec Islands (Raoul, Macauley Islands). New Zealand: Three Kings, North, South and Rekohu (Chatham Island). Known in the North Island from Te Pahi south to Wellington but mainly coastal and absent from large parts of the island (it has also been recorded as a 'weed' in Auckland, Hamilton, Tauranga and Wellington). Locally common around Geothermal areas of the Taupo Volcanic Zone. In the South Island known only from the coast north-west Nelson and northern Westland. Present on Norfolk, Samoa, Tahiti. Cook and the Marquesas islands. Habitat: A weedy species of coastal, lowland and geothermal habitats."

204	Native or naturalized in regions with tropical or subtropical climates	y
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"Adventive in a few localities in the Mount Lofty Ranges, S.A.; occurs naturally on Norfolk Is., Kermadec Is., New Zealand, Samoa, Tahiti and Marquesas Is. Grows in moist, open situations or along stream banks as a presumed glass-house escape."

Qsn #	Question	Answer
	Nitta, J. H., Meyer, J.-Y., & Smith, A. R. (2011). Pteridophytes of Mo'orea, French Polynesia: Additional New Records. American Fern Journal, 101(1), 36–49	"Mo'orea, Mt. Tohiewa, 17.55068°S, 149.82233°W, ca. 1212 m, 16 Sep 2008, /. Nitta 260, with J.-Y. Meyer, R. Taputuarai, and M. Fourdrigniez (P, PAP, TNS, UC); Mo'orea, crete SE du Mt. Tohiewa, 17.55°S, 149.82°W, ca. 1100 m, 23 Oct 1986, /. Florence 7968 (P, PAP). Terrestrial. Previously known from New Zealand, Norfolk Island, Samoa, the Marquesas Islands, and Tahiti (Brownsey and Smith-Dodsworth, 1989)."
	Brownsey, P. J., & Chinnock, R. J. (1987). A taxonomic revision of the Australian species of <i>Hypolepis</i> . Journal of the Adelaide Botanic Garden, 10(1): 1-30	"This species is known with certainty only from Norfolk Island, the Kermadec Islands and parts of New Zealand (Brownsey & Chinnock, 1984), although it is now thought that it may also occur at altitudes above about 1000 m on Tahiti and the Marquesas Islands in the eastern Pacific. A few early specimens (e.g. MEL 47094) suggest that it may once have been present on Lord Howe Island, but it has not been collected there in recent years. The possibility that it may also occur naturally on the mainland of Australia should not be overlooked. The species does occur in the Mount Lofty Ranges of South Australia from where it has been erroneously recorded as <i>H. punctata</i> (Black, 1978). However, these populations are believed to have been introduced."
	Yanger, C. (2022). U.S. Geological Survey PIERC. Pers. Comm. 28 October	[Present in Hawaii Volcanoes National Park, and perhaps elsewhere on Hawaii island] "We've been dealing with an introduced fern within HAVO called <i>Hypolepis dicksonioides</i> -it seems it may have been misidentified as <i>H. hawaiiensis</i> for decades."

205	Does the species have a history of repeated introductions outside its natural range?	n
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"Adventive in a few localities in the Mount Lofty Ranges, S.A.; occurs naturally on Norfolk Is., Kermadec Is., New Zealand, Samoa, Tahiti and Marquesas Is. Grows in moist, open situations or along stream banks as a presumed glass-house escape."
	Yanger, C. (2022). U.S. Geological Survey PIERC. Pers. Comm. 28 October	[Present in Hawaii Volcanoes National Park, and perhaps elsewhere on Hawaii island] "We've been dealing with an introduced fern within HAVO called <i>Hypolepis dicksonioides</i> -it seems it may have been misidentified as <i>H. hawaiiensis</i> for decades."

Qsn #	Question	Answer
301	Naturalized beyond native range	y
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"Adventive in a few localities in the Mount Lofty Ranges, S.A.; occurs naturally on Norfolk Is., Kermadec Is., New Zealand, Samoa, Tahiti and Marquesas Is. Grows in moist, open situations or along stream banks as a presumed glass-house escape."
	Brownsey, P.J. & Perrie, L.R. (2018): Dennstaedtiaceae . In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 19. Manaaki Whenua Press, Lincoln	"Also Norfolk Island, Samoa, Cook Islands, Tahiti and Marquesas Islands (Brownsey 1987; Sykes 2016). It is naturalised in South Australia (Brownsey 1998)."
	Yanger, C. (2022). U.S. Geological Survey PIERC. Pers. Comm. 28 October	[Present in Hawaii Volcanoes National Park, and perhaps elsewhere on Hawaii island] "We've been dealing with an introduced fern within HAVO called <i>Hypolepis dicksonioides</i> -it seems it may have been misidentified as <i>H. hawaiiensis</i> for decades."

302	Garden/amenity/disturbance weed	y
	Source(s)	Notes
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 9 Nov 2022]	"A weedy species of coastal, lowland and geothermal habitats. Naturally short-lived, plants may appear as and when suitable habitat is generated following disturbance. As such this species has also appeared in urban situations and can from time to time be found growing in cities on rock walls, in bark gardens, or even protruding from cracks in asphalt pavements. It has also been recorded as a weed in garden centres."
	Brownsey, P.J. & Perrie, L.R. (2018): Dennstaedtiaceae . In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 19. Manaaki Whenua Press, Lincoln	"It prefers disturbed or sandy soils, and sometimes grows amongst bracken. It also appears as a weed in gardens and urban environments."
	Brownsey, P. J., & Chinnock, R. J. (1984). A taxonomic revision of the New Zealand species of <i>Hypolepis</i> . New Zealand Journal of Botany, 22(1), 43-80	[Disturbance adapted] "Species of <i>Hypolepis</i> in New Zealand are almost all plants of disturbed ground and short-lived in anyone place - the only exceptions being <i>H. millefolium</i> , which frequently spreads over considerable areas by means of its underground rhizomes and persists for many years in the same locality, and <i>H. distans</i> , which can survive on rot-ting tree stumps for long periods. The other species, notably <i>H. lactea</i> . <i>H. rufobarbata</i> . <i>H. ambigua</i> , and <i>H. dicksonioides</i> , are colonisers of disturbed ground and come up rapidly in cleared or damaged forest but are replaced within a few years by other forest plants."

303	Agricultural/forestry/horticultural weed	
	Source(s)	Notes
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 10 Nov 2022]	"It has also been recorded as a weed in garden centres." [A potential horticultural weed]

304	Environmental weed	
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Qsn #	Question	Answer
	Source(s)	Notes
	King, C., & Forsyth, D. (Eds.). (2021). The Handbook of New Zealand Mammals. CSIRO Publishing, Clayton South VIC	[Interferes with succession following removal of goats] "The usual method of assessing the extent of goat impacts has been to compare the diversity and structure of vegetation in areas with and without goats in fenced exclosures or on islands. The original subtropical forest of Macauley I. was reduced to a short grassland of <i>Microlaena stipoides</i> by goats after the island was burnt.229,303 Removal of the goats in 1970 has not reversed this process, and the remnant woody vegetation (<i>Myoporum rapense</i> subsp. <i>kermadecense</i>) has not spread, presumably because it is outcompeted by the now-dominant vegetation of tall sedge (<i>Cyperus ustulatus</i>) and ferns (<i>Hypolepis dicksonioides</i>).303"
	WRA Specialist. (2022). Personal Communication	Plants misidentified as the native fern <i>Hypolepis hawaiiensis</i> may be having detrimental effects in the natural environment. Further determination of the current distribution of <i>Hypolepis dicksonioides</i> is required.

305	Congeneric weed	y
	Source(s)	Notes
	de Lange, P.J. (2022): <i>Hypolepis ambigua</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-ambigua/ . [Accessed 9 Nov 2022]	"A 'weedy' species of disturbed sites in open forest, forest clearings, forest margins, in scrub, and in open grassland. It is often a component of brackenfield and as with <i>H. dicksonioides</i> , <i>H. ambigua</i> frequently colonises urban areas, where at times it can become a troublesome 'weed'."
	Brownsey, P.J. & Perrie, L.R. (2018): <i>Dennstaedtiaceae</i> . In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 19. Manaaki Whenua Press, Lincoln	[<i>Hypolepis ambigua</i>] "It can form extensive colonies spreading by means of its rapidly growing rhizomes, and may also grow as a weed in gardens."
	Kramer, K.U. & Green, P.S. (1990). The Families and Genera of Vascular Plants. Volume 1. Pteridophytes and Gymnosperms. Springer-Verlag, Berlin, Heidelberg, New York	[Other species described as weedy] "The number of species is estimated at about 40, but the genus is not well known. It is distributed in tropical and south-temperate regions of the world, with local extensions into north-temperate areas (E. Asia, Florida); the species are often of local occurrence but are not rarely abundant in open places and secondary vegetation, where they may become somewhat weedy, e. g., <i>H. sparsisora</i> (Schrad.) Kuhn in Africa."
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	<i>Hypolepis punctata</i> cited as a weed of unspecified impacts in Japan. <i>Hypolepis repens</i> cited as a cultivation escape. <i>Hypolepis rugosula</i> cited as naturalized and/or a weed in Australia

401	Produces spines, thorns or burrs	n
	Source(s)	Notes

Qsn #	Question	Answer
	Brownsey, P.J. & Perrie, L.R. (2018): Dennstaedtiaceae . In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 19. Manaaki Whenua Press, Lincoln	[No evidence] "Rhizomes long-creeping, 3–8 mm diameter, with stipes arising 35–200 mm apart, or rarely 10 mm apart when growing on pumice; bearing pale brown or chestnut-brown non-glandular hairs up to 3 mm long. Fronds 220–2450 mm long. Stipes 70–1400 mm long, 2–15 mm diameter, red-brown proximally, chestnut-brown or yellow-brown distally, with two dark vertical bands (when fresh), bearing red brown non-glandular hairs proximally and colourless glandular and non-glandular hairs distally, up to 5 mm long. Rachises chestnut-brown or yellow-brown proximally, green distally, bearing abundant colourless glandular and non-glandular hairs up to 3 mm long. Laminae 3-pinnate to deeply 4-pinnate pinnatifid or almost 5-pinnate, ovate or broadly ovate or broadly elliptic, tapering to a pinnatifid apex, 150–1500 mm long, 90–1100 mm wide, light green on both surfaces, herbaceous; colourless glandular and non-glandular hairs on abaxial lamina surface and costae but absent from lamina margin, 0.3–1.5 mm long. Primary pinnae in 15–30 pairs below pinnatifid apex, overlapping, narrowly winged distally, the proximal pair arising at 30–50° to rachis; distal primary pinnae ovate or narrowly ovate; proximal primary pinnae ovate; the longest at or near the base, 55–860 mm long, 27–480 mm wide, apices acute or acuminate, bases stalked. Secondary pinnae decreasing in length along primary pinnae to the distal end, winged distally, or throughout in less divided fronds; the longest ovate or narrowly ovate, 17–360 mm long, 7–170 mm wide, apices acute or acuminate, bases stalked. Tertiary pinnae winged throughout; the longest ovate or narrowly ovate, 5–90 mm long, 2–40 mm wide, apices acute or obtuse, bases short-stalked to adnate. Quaternary pinnae narrowly ovate or oblong, 7–16 mm long, 2–6 mm wide, adnate, deeply divided on larger fronds into ultimate segments up to 4 mm long and 2 mm wide. Veins ending in apices of ultimate segments. Sori ± round, protected by distinct reflexed lamina flaps (green at the base, membranous at apex); paraphyses absent. Mean spore size 38–39 µm long, 22–25 µm wide; perispores pale, echinate and reticulate."

402	Allelopathic	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown. No evidence found

403	Parasitic	n
	Source(s)	Notes
	Kramer, K.U. & Green, P.S. (1990). The Families and Genera of Vascular Plants. Volume 1. Pteridophytes and Gymnosperms. Springer-Verlag, Berlin, Heidelberg, New York	"Medium-sized to large, terrestrial or epilithic ferns, the stem long-creeping, often much branched and forming large clones, solenostelic, bearing pluricellular trichomes." [Genus description. No evidence]

404	Unpalatable to grazing animals	
	Source(s)	Notes

Qsn #	Question	Answer
	Takatsuki, S. (2009). Effects of sika deer on vegetation in Japan: a review. <i>Biological Conservation</i> , 142(9), 1922-1929	[Unknown. Other species reported to be unpalatable to deer, and probably other browsing animals] "Unpalatable plants like <i>Perilla frutescens</i> (Labiatae), <i>Pteridium aquilinum</i> (Dennstaedtiaceae) and <i>Hypolepis punctata</i> (Dennstaedtiaceae) grow at such habitats. In humid habitats, unpalatable plants like <i>Senecio cannabifolius</i> (Asteraceae) and <i>Primula japonica</i> (Primulaceae) grow (Takatsuki and Ito, 2009)."

405	Toxic to animals	n
	Source(s)	Notes
	Quattrocchi, U. (2012). <i>CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology</i> . CRC Press, Boca Raton, FL	No evidence
	Wagstaff, D.J. (2008). <i>International poisonous plants checklist: an evidence-based reference</i> . CRC Press, Boca Raton, FL	No evidence

406	Host for recognized pests and pathogens	
	Source(s)	Notes
	Hoshizaki, B.J. & Moran, R.C. (2001). <i>Fern Grower's Manual. Revised and Expanded Edition</i> . Timber Press, Portland, OR	[Specifics unknown. General description of fern pests and diseases] "For signs of pest or disease damage, check the roots for abnormalities, particularly decay. Look carefully on the undersides of the fronds for specks, dots, or unusual-looking structures—do not confuse these with the clusters of spore cases or sori. Most sori are regularly placed on the underside of the frond, whereas insects are unevenly scattered and often favor nesting in the angle of the veins. Sucking insects can cause poor growth, puckered foliage, distortion, bleached spots, and discoloration (discoloration is also caused by nematodes). The most common sucking insects on ferns are aphids, scale insects, mealybugs, and thrips. Biting insects and pests chew parts of the frond away. Some of the common examples are grasshoppers, caterpillars, cutworms, pillbugs, sowbugs, slugs, and snails. Their presence may often be indicated by frass on the foliage. Fungal or bacterial infections usually accompany overwatering or excessive humidity. They usually produce symptoms such as tissue that is rotted, slimy, or water-soaked. Sometimes colonies of the organisms can be seen as tufts or mats of mold, sooty spots, and circular spots of dead tissue, particularly those with small dots or concentric patterns. The organisms can be found anywhere on the plant. Do not overlook the base of the stipe near the soil; infections sometimes start there. Fungi can cause sudden wilting of the plant, marginal browning of fronds, and distortion of emerging fronds. These symptoms, however, are difficult to distinguish from culturally caused troubles."

407	Causes allergies or is otherwise toxic to humans	n
	Source(s)	Notes

Qsn #	Question	Answer
	Quattrocchi, U. (2012). CRC World Dictionary of Medicinal and Poisonous Plants: Common Names, Scientific Names, Eponyms, Synonyms, and Etymology. CRC Press, Boca Raton, FL	No evidence
	Wagstaff, D.J. (2008). International poisonous plants checklist: an evidence-based reference. CRC Press, Boca Raton, FL	No evidence

408	Creates a fire hazard in natural ecosystems	n
	Source(s)	Notes
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 10 Nov 2022]	" <i>Hypolepis dicksonioides</i> is a short-lived, naturally ephemeral, opportunistic species, which requires frequent disturbance to create fresh habitats to colonise." [No evidence]
	Brownsey, P.J. & Perrie, L.R. (2018): Dennstaedtiaceae . In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 19. Manaaki Whenua Press, Lincoln	[No evidence. An ephemeral species that does not occur in fire prone areas] "Grows in open places, on rocky coastal slopes, among boulders, at cliff bases, on pumice beds and scoria (where it is often very stunted), on thermally heated soil and along hot streams, in ditches, on roadsides, in poor pasture, on old logs, on forest margins, in open coastal forest and forest clearings, and under <i>Pinus</i> plantations. It prefers disturbed or sandy soils, and sometimes grows amongst bracken."

409	Is a shade tolerant plant at some stage of its life cycle	
	Source(s)	Notes
	Tryon, R. M., & Tryon, A. F. (1982). Ferns and Allied Plants: With Special Reference to Tropical America. Springer-Verlag, New York	" <i>Hypolepis</i> usually grows in forests or along their borders, in clearings and thickets, sometimes in moist to wet, open habitats." [Generic description]
	Brownsey, P.J. & Perrie, L.R. (2018): Dennstaedtiaceae . In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 19. Manaaki Whenua Press, Lincoln	[May tolerate some shade, but primarily occurs in open, higher light environments] "Grows in open places, on rocky coastal slopes, among boulders, at cliff bases, on pumice beds and scoria (where it is often very stunted), on thermally heated soil and along hot streams, in ditches, on roadsides, in poor pasture, on old logs, on forest margins, in open coastal forest and forest clearings, and under <i>Pinus</i> plantations."
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 10 Nov 2022]	[Occurs in disturbed, presumably high light environments] "Naturally short-lived, plants may appear as and when suitable habitat is generated following disturbance. As such this species has also appeared in urban situations and can from time to time be found growing in cities on rock walls, in bark gardens, or even protruding from cracks in asphalt pavements."

410	Tolerates a wide range of soil conditions (or limestone conditions if not a volcanic island)	n
	Source(s)	Notes

Qsn #	Question	Answer
	Brownsey, P.J. & Perrie, L.R. (2018): Dennstaedtiaceae . In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 19. Manaaki Whenua Press, Lincoln	"It prefers disturbed or sandy soils, and sometimes grows amongst bracken."
	Brownsey, P. J., & Chinnock, R. J. (1984). A taxonomic revision of the New Zealand species of <i>Hypolepis</i> . New Zealand Journal of Botany, 22(1), 43-80	"On the main islands of New Zealand, apart from thermal sites, it is confined to coastal regions, preferring sandy soils or disturbed ground on forest margins."

411	Climbing or smothering growth habit	n
	Source(s)	Notes
	Brownsey, P.J. & Perrie, L.R. (2018): Dennstaedtiaceae . In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 19. Manaaki Whenua Press, Lincoln	"Rhizomes long-creeping, 3–8 mm diameter, with stipes arising 35–200 mm apart, or rarely 10 mm apart when growing on pumice; bearing pale brown or chestnut-brown non-glandular hairs up to 3 mm long. Fronds 220–2450 mm long."

412	Forms dense thickets	y
	Source(s)	Notes
	de Lange, P. J. (2015). Recent vegetation succession and flora of Macauley Island, southern Kermadec Islands. Bulletin of the Auckland Museum, 20, 207-230	"As reported by Greene et al. (2004) and Barkla et al. (2008) <i>Hypolepis fernland</i> (Fig. 6) now forms the dominant vegetation association on Macauley Island (Fig. 8). The fernland ranges from near sea level along the ravine and gully bottoms to the summit slopes of Mt Haszard, and it entirely blankets the crater below that peak. Although I was unable to accurately assess its percentage cover on the island it is likely to cover more than 70% of the plateau, and it is also the most common vegetation association covering the floors of the larger gullies and ravines (Fig. 8, 11A). The fernland is comprised entirely of a monotonous, dense (100% cover) of actively growing fronds of <i>Hypolepis dicksonioides</i> , surmounting a dense layer of dead or dying fronds and rhizomes of this species. During my visit this mass was in places up to 2 m tall though it was more usually within the range of 0.8–1.5 m. With the exception of one place, on a ridgeline running north to the Mt Haszard crater where a few, widely spaced, solitary <i>Homalanthus</i> have broken through this fernland, there are no other associated plants. As noted by past ornithological teams this dense fernland is suboptimal habitat for nesting birds (Taylor & Tennyson 1988; Greene et al. 2004) and I saw very few petrel burrows; those seen occurring mainly along the ecotone between the fernland and <i>Cyperus</i> sedgeland. In the few places where active burrows were present, these were occupied by black-winged petrels and wedge-tailed shearwaters."
	Sykes, W. R., & West, C. J. (1996). New records and other information on the vascular flora of the Kermadec Islands. New Zealand Journal of Botany, 34(4), 447-462	"The fern <i>Hypolepis dicksonioides</i> has now formed large dense stands in and around gullies in the northern part of the Plateau and <i>Asplenium obtusatum</i> subsp. <i>northlandicum</i> has increased around the margins and in the main gullies."
	Tryon, R. M., & Tryon, A. F. (1982). Ferns and Allied Plants: With Special Reference to Tropical America. Springer-Verlag, New York	[Generic description] " <i>Hypolepis</i> may form dense colonies in shrubby vegetation and among small trees."

Qsn #	Question	Answer
	Barkla, J. W., Dilks, P. J., Greene, T. C., & Griffiths, R. (2008). <i>Homalanthus polyandrus</i> (Euphorbiaceae) on Macauley Island, southern Kermadec Islands, with notes on that island's vascular flora. <i>New Zealand Journal of Botany</i> 46: 373-379	[Macauley Island] "The plateau surface is dominated by dense, 2 m tall <i>Hypolepis dicksonioides</i> fernland and 1 m tall <i>Cyperus insularis</i> sedgeland (Fig. 2)." ... "A visit in 1988 recorded that <i>Cyperus insularis</i> (as <i>C. ustulatus</i>) covered at least 70% of the surface and that the fern <i>Hypolepis dicksonioides</i> had formed large and dense stands in and around gullies in the northern part of the plateau (Taylor & Tennyson 1988)." ... "An expedition to assess the status of the Kermadec red-crowned parakeet population in 2002 reported further dramatic vegetation changes. Remarkably it was now <i>Hypolepis dicksonioides</i> that covered 70% of the plateau, with <i>Cyperus insularis</i> reduced to patches within a sea of fern (Greene et al. 2004)." ... "Our visit in 2006 found <i>Hypolepis dicksonioides</i> to be at least as dominant as it was in 2002 although die-off of patches up to 1 ha was noted."

501	Aquatic	n
	Source(s)	Notes
	Director of National Parks. (2010). Norfolk Island Region Threatened Species Recovery Plan. Department of the Environment, Water, Heritage and the Arts, Canberra	"A terrestrial fern with fronds growing to 100cm or longer."
	Brownsey, P.J. & Perrie, L.R. (2018): <i>Dennstaedtiaceae</i> . In: Breitwieser, I.; Wilton, A.D. <i>Flora of New Zealand - Ferns and Lycophytes</i> . Fascicle 19. Manaaki Whenua Press, Lincoln	[Terrestrial] "Grows in open places, on rocky coastal slopes, among boulders, at cliff bases, on pumice beds and scoria (where it is often very stunted), on thermally heated soil and along hot streams, in ditches, on roadsides, in poor pasture, on old logs, on forest margins, in open coastal forest and forest clearings, and under <i>Pinus</i> plantations."

502	Grass	n
	Source(s)	Notes
	Brownsey, P.J. & Perrie, L.R. (2018): <i>Dennstaedtiaceae</i> . In: Breitwieser, I.; Wilton, A.D. <i>Flora of New Zealand - Ferns and Lycophytes</i> . Fascicle 19. Manaaki Whenua Press, Lincoln	<i>Dennstaedtiaceae</i>

503	Nitrogen fixing woody plant	n
	Source(s)	Notes
	Brownsey, P.J. & Perrie, L.R. (2018): <i>Dennstaedtiaceae</i> . In: Breitwieser, I.; Wilton, A.D. <i>Flora of New Zealand - Ferns and Lycophytes</i> . Fascicle 19. Manaaki Whenua Press, Lincoln	<i>Dennstaedtiaceae</i>

Qsn #	Question	Answer
504	Geophyte (herbaceous with underground storage organs -- bulbs, corms, or tubers)	n
	Source(s)	Notes
	Brownsey, P.J. & Perrie, L.R. (2018): Dennstaedtiaceae . In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 19. Manaaki Whenua Press, Lincoln	[Rhizomatous] "Rhizomes long-creeping, 3–8 mm diameter, with stipes arising 35–200 mm apart, or rarely 10 mm apart when growing on pumice; bearing pale brown or chestnut-brown nonglandular hairs up to 3 mm long. Fronds 220–2450 mm long."

601	Evidence of substantial reproductive failure in native habitat	n
	Source(s)	Notes
	Brownsey, P.J. & Perrie, L.R. (2018): Dennstaedtiaceae . In: Breitwieser, I.; Wilton, A.D. Flora of New Zealand - Ferns and Lycophytes. Fascicle 19. Manaaki Whenua Press, Lincoln	[Not rare elsewhere in native range] "Distribution: North Island: Northland, Auckland, Volcanic Plateau, Gisborne, Taranaki, Southern North Island. South Island: Western Nelson, Sounds-Nelson. Kermadec Islands, Chatham Islands. Altitudinal range: 0–750 m. <i>Hypolepis dicksonioides</i> occurs on Raoul, Macauley and South Meyer Islands in the Kermadec Islands. In the North Island it occurs mostly in coastal and lowland sites from Te Kao, Aupori Ecological District, to Auckland, and in scattered localities from the Bay of Plenty to Wellington. It occurs at higher elevations around thermal areas from Rotorua to Taupō, and reaches 750 m near Wairakei. In the South Island it occurs only in coastal areas of north-west Nelson and the Marlborough Sounds. It has also been recorded from the Chatham Islands. Also Norfolk Island, Samoa, Cook Islands, Tahiti and Marquesas Islands (Brownsey 1987; Sykes 2016). It is naturalised in South Australia (Brownsey 1998)."
	Director of National Parks. (2010). Norfolk Island Region Threatened Species Recovery Plan. Department of the Environment, Water, Heritage and the Arts, Canberra	[Rare on Norfolk Island] "Conservation Significance Australian distribution restricted to Norfolk and Phillip Islands but also occurs in Kermadec Islands, New Zealand, Samoa, Society Islands and Marquesas. Distribution and Abundance The number of mature individuals was less than 500 in 2003 (TSSC 2003c). This species occurs on Norfolk and Phillip Islands and has been recorded from Mt Bates (Orchard 1994). In a 1995 survey it was reported from only one site apart from Phillip Island and was much less common than in 1971 (Brownsey & Chinnock 1987, Braggins 1996). On Phillip Island, this fern is uncommon but widespread. It is most common in First West End Valley and the valleys across the eastern part of the island (Mills 2009b)."

Qsn #	Question	Answer
602	Produces viable seed	y
	Source(s)	Notes
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 3 Nov 2022]	"Easily grown from fresh spores. Inclined to become invasive and weedy in garden situations. Despite this the extremely robust, strongly deltoid, bright green fronds are rather attractive. It is naturally rather short-lived but rapidly establishes by spores in ideal situations. It is frost tender although established plants merely die back during winter"
	Brownsey, P.J. & Perrie, L.R. (2018): <i>Dennstaedtiaceae</i> . In: Breitwieser, I.; Wilton, A.D. <i>Flora of New Zealand - Ferns and Lycophytes</i> . Fascicle 19. Manaaki Whenua Press, Lincoln	"Sori ± round, protected by distinct reflexed lamina flaps (green at the base, membranous at apex); paraphyses absent. Mean spore size 38–39 µm long, 22–25 µm wide; perispores pale, echinate and reticulate."

603	Hybridizes naturally	y
	Source(s)	Notes
	Brownsey, P. J., & Chinnock, R. J. (1984). A taxonomic revision of the New Zealand species of <i>Hypolepis</i> . <i>New Zealand Journal of Botany</i> , 22(1), 43-80	"As with many other genera ferns in New Zealand, species of <i>Hypolepis</i> tend to hybridise when they occur in close proximity in suitable habitats. Six hybrid combinations, involving all species except <i>H. distans</i> and <i>H. subantarctica</i> , have been recorded from the New Zealand region, but only one, <i>H. ambigua</i> X <i>ru/obarbata</i> , is common." ... " <i>Hypolepis ambigua</i> X <i>dicksonioides</i> ... Hybrids are common only in thermal areas where the two parent species frequently grow together in some abundance. They probably also occur in other areas where <i>H. ambigua</i> and <i>H. dicksonioides</i> are found in close proximity, but have been overlooked in the past because of their similarity to the parent species." ... " <i>Hypolepis dicksonioides</i> x <i>lactea</i> ... The combination is apparently very rare and is known from only three collections."
	Brownsey, P.J. & Perrie, L.R. (2018): <i>Dennstaedtiaceae</i> . In: Breitwieser, I.; Wilton, A.D. <i>Flora of New Zealand - Ferns and Lycophytes</i> . Fascicle 19. Manaaki Whenua Press, Lincoln	"Hybridisation: There is evidence for hybridisation between <i>H. ambigua</i> and <i>H. dicksonioides</i> (AK 266639, CHR 212707, WELT P011525), <i>H. lactea</i> (AK 298766–298767), <i>H. millefolium</i> (WELT P011837) and <i>H. rufobarbata</i> (AK 170251, CHR 280735, WELT P011530). Hybrids can be recognised by their aborted spores (see Brownsey & Chinnock 1984). The combination <i>H. ambigua</i> × <i>rufobarbata</i> is found commonly where the two species occur together, whilst <i>H. ambigua</i> × <i>dicksonioides</i> arises frequently in thermal areas."
	Tryon, R. M., & Tryon, A. F. (1982). <i>Ferns and Allied Plants: With Special Reference to Tropical America</i> . Springer-Verlag, New York	[Genus description] "The large range of chromosome numbers reported for <i>Hypolepis</i> indicates complex cytological changes, although several species have meiotic numbers of 52 or 104. Reports of putative hybrids involving <i>H. viscosa</i> from Oaxaca, Mexico, and <i>H. repens</i> from Costa Rica are based upon study of chromosome pairing in triploid plants (Smith and Mickel, 1977). The record of $n = 29$ in <i>H. nigrescens</i> from Jamaica (Walker, 1966), and from Oaxaca, Mexico (Smith and Mickel, 1977), is a divergent number for the genus. However, Walker (1973) suggests that the basic numbers 26 and 29 may represent a short aneuploid series."

604	Self-compatible or apomictic	
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Qsn #	Question	Answer
	Source(s)	Notes
	Verma, S. C. (2003). Some aspects of reproductive biology of the gametophyte generation of homosporous ferns. In <i>Pteridology in the New Millennium</i> (pp. 455-484). Springer, Dordrecht	[Unknown. Another <i>Hypolepis</i> species may exhibit outcrossing, rather than selfing, in the gametophyte stage] "In the tetraploid <i>Hypolepis punctata</i> , MI varies from 0.18 to 0.91 suggesting that polyploid species are not necessarily tuned for intragametophytic selfing but can possess mechanisms in their genetic machinery that favour intergametophytic mating"

605	Requires specialist pollinators	n
	Source(s)	Notes
	Mehrtreter, K., Walker, L.R. & Sharpe, J.M. (2010). <i>Fern Ecology</i> . Cambridge University Press, Cambridge, UK	[Requires water. General description] "Gametophytes may be male or female, or may produce both types of gametangia. For fertilization, the sperm cell must swim through water to an egg cell (Fig. 1.2). Most fern species cross-fertilize (i.e., sperm fertilizes an egg cell from a different gametophyte), but the gametophytes are potentially bisexual. If the gametophyte has simultaneously functioning archegonia and antheridia it may self-fertilize (i.e., sperm fertilizes an egg cell from the same gametophyte), which is of advantage after long distance dispersal."

606	Reproduction by vegetative fragmentation	y
	Source(s)	Notes
	Brownsey, P. J., & Chinnock, R. J. (1987). A taxonomic revision of the Australian species of <i>Hypolepis</i> . <i>Journal of the Adelaide Botanic Garden</i> , 10(1): 1-30	[Can spread by creeping rhizomes] "Rhizome long-creeping, (3-) 4-8 mm diameter, densely covered in pale brown hairs near growing apex, elsewhere more scattered hairs becoming red-brown."
	Olsen, S. (2007). <i>Encyclopedia of Garden Ferns</i> . Timber Press, Portland, Oregon	[Capable of being propagated by division] " <i>Hypolepis</i> Worldwide there are 50 to 60 of these bramble ferns native primarily to Southeast Asia and islands of the South Pacific. They have long-creeping, branching rhizomes that can become aggressive when too happy. The deciduous fronds are much divided and tall. Sori are marginal and under a recurved flap or toothlike indusium. In Southern California, they are popular for use as ground covers or container plantings. Multiply them by division or propagate from spores. The genus name means "under scale," in reference to the protected sori."

607	Minimum generative time (years)	
	Source(s)	Notes
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 10 Nov 2022]	" <i>Hypolepis dicksonioides</i> is a short-lived, naturally ephemeral, opportunistic species, which requires frequent disturbance to create fresh habitats to colonise." [Likely between 1-2 years to maturity]

701	Propagules likely to be dispersed unintentionally (plants growing in heavily trafficked areas)	
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Qsn #	Question	Answer
	Source(s)	Notes
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 9 Nov 2022]	[Potentially, although not officially documented. Thrives in disturbed and heavily trafficked areas. Small, wind-dispersed spores could be accidentally moved in soil or on footwear, vehicles, and equipment] "A weedy species of coastal, lowland and geothermal habitats. Naturally short-lived, plants may appear as and when suitable habitat is generated following disturbance. As such this species has also appeared in urban situations and can from time to time be found growing in cities on rock walls, in bark gardens, or even protruding from cracks in asphalt pavements. It has also been recorded as a weed in garden centres."

702	Propagules dispersed intentionally by people	y
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"Grows in moist, open situations or along stream banks as a presumed glass-house escape." [Escapes occur from intentionally cultivated glass-house plants]
	Randall, R.P. (2017). A Global Compendium of Weeds. 3rd Edition. Perth, Western Australia. R.P. Randall	"Major Pathway/s: Ornamental Dispersed by: Humans"
	Big Plant Nursery. (2022). <i>Hypolepis dicksonioides</i> . https://www.bigplantnursery.co.uk/shop/plants/ferns-and-tree-ferns/hypolepis-dicksonioides/ . [Accessed 3 Nov 2022]	"Still very rare in cultivation the plants we offer are in limited supply and are all home grown by ourselves."
	Yanger, C. (2022). U.S. Geological Survey PIERC. Pers. Comm. 28 October	"We've been dealing with an introduced fern within HAVO called <i>Hypolepis dicksonioides</i> -it seems it may have been misidentified as <i>H. hawaiiensis</i> for decades." [Mode of introduction unknown]

703	Propagules likely to disperse as a produce contaminant	y
	Source(s)	Notes
	Australian Biological Resources Study. (1998). Flora of Australia Volume 48, Ferns, Gymnosperms and Allied Groups. CSIRO Publishing, Melbourne	"Grows in moist, open situations or along stream banks as a presumed glass-house escape." [Glass-house cultivated plants could contaminate soil of other potted or cultivated plants]
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 9 Nov 2022]	"It has also been recorded as a weed in garden centres." [Suggests ferns, spores or gametophytes can be spread as contaminants of other cultivated plants]
	WRA Specialist. (2022). Personal Communication	Mistakenly sold as the native <i>Hypolepis hawaiiensis</i> in Volcano, Hawaii. Otherwise, not known to be intentionally cultivated or spread in the nursery trade in the Hawaiian Islands

Qsn #	Question	Answer
704	Propagules adapted to wind dispersal	y
	Source(s)	Notes
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 3 Nov 2022]	"Minute spores are wind dispersed (Thorsen et al., 2009)."

705	Propagules water dispersed	y
	Source(s)	Notes
	Brownsey, P.J. & Perrie, L.R. (2018): <i>Dennstaedtiaceae</i> . In: Breitwieser, I.; Wilton, A.D. <i>Flora of New Zealand - Ferns and Lycophytes</i> . Fascicle 19. Manaaki Whenua Press, Lincoln	[Stream and ditch-side distribution suggests wind-dispersed spores are also moved by water] "Grows in open places, on rocky coastal slopes, among boulders, at cliff bases, on pumice beds and scoria (where it is often very stunted), on thermally heated soil and along hot streams, in ditches, on roadsides, in poor pasture, on old logs, on forest margins, in open coastal forest and forest clearings, and under <i>Pinus</i> plantations."

706	Propagules bird dispersed	n
	Source(s)	Notes
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 10 Nov 2022]	"Minute spores are wind dispersed"

707	Propagules dispersed by other animals (externally)	n
	Source(s)	Notes
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 10 Nov 2022]	"Minute spores are wind dispersed" [Possible that minute spores may be secondarily dispersed by adhering to animals, but wind, and potentially water, are the most likely dispersal modes]

708	Propagules survive passage through the gut	n
	Source(s)	Notes
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 10 Nov 2022]	"Minute spores are wind dispersed" [No evidence that spores are internally dispersed]

801	Prolific seed production (>1000/m2)	y
	Source(s)	Notes

Qsn #	Question	Answer
	Gordon, D. R., Mitterdorfer, B., Pheloung, P. C., Ansari, S., Buddenhagen, C., Chimera, C., ... & Williams, P. A. (2010). Guidance for addressing the Australian Weed Risk Assessment questions. <i>Plant Protection Quarterly</i> , 25(2): 56-74	"Assume 'yes' for fern taxa unless contradictory evidence exists."
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 3 Nov 2022]	"Minute spores are wind dispersed (Thorsen et al., 2009)."
	Brownsey, P.J. & Perrie, L.R. (2018): Dennstaedtiaceae . In: Breitwieser, I.; Wilton, A.D. <i>Flora of New Zealand - Ferns and Lycophytes</i> . Fascicle 19. Manaaki Whenua Press, Lincoln	"Sori ± round, protected by distinct reflexed lamina flaps (green at the base, membranous at apex); paraphyses absent. Mean spore size 38–39 µm long, 22–25 µm wide; perispores pale, echinate and reticulate."

802	Evidence that a persistent propagule bank is formed (>1 yr)	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown

803	Well controlled by herbicides	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown. No information on herbicide efficacy or chemical control of this species

804	Tolerates, or benefits from, mutilation, cultivation, or fire	
	Source(s)	Notes
	de Lange, P.J. (2022): <i>Hypolepis dicksonioides</i> Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/hypolepis-dicksonioides/ . [Accessed 10 Nov 2022]	[Unknown. Short-lived] " <i>Hypolepis dicksonioides</i> is a short-lived, naturally ephemeral, opportunistic species, which requires frequent disturbance to create fresh habitats to colonise. As such it is naturally uncommon, and biologically sparse. In the main islands of New Zealand it is usually scarce. However, on the Kermadec Islands, especially Macauley Island it forms the dominant vegetation."

805	Effective natural enemies present locally (e.g. introduced biocontrol agents)	
	Source(s)	Notes
	WRA Specialist. (2022). Personal Communication	Unknown

Summary of Risk Traits:

High Risk / Undesirable Traits

- Broad climate suitability (temperate to tropical regions)
- Escaped or naturalized in Australia, and the Hawaiian Islands (recently confirmed)
- A short-lived, weedy fern of disturbed habitats, open sites, gardens, and urban environments
- Mistakenly identified as a native fern (*Hypolepis hawaiiensis*); may be having detrimental effects in the natural environment. Further determination of its current distribution is required.
- Other species are weedy
- Reported to be a short-lived, ephemeral fern in most areas, but capable of forming dense stands on Macauley Island (southern Kermadec Islands)
- Reproduces by spores and vegetatively by rhizomes
- Hybridizes with other *Hypolepis* species; could potentially cross with native Hawaiian fern (*Hypolepis hawaiiensis*)
- Spores dispersed by wind, water, as a garden contaminant, and intentionally cultivated in some areas
- Prolific spore production

Low Risk Traits

- A short-lived fern in much of its natural range; distribution and negative impacts in the Hawaiian Islands currently unknown
- Unarmed (no spines, thorns, or burrs)
- Non-toxic
- Grows best in high light environments (dense shade may inhibit spread)