Australian Government
Department of Agriculture, Water and the Environment

Conservation Advice for *Turnix varius scintillans* (painted button-quail (Houtman Abrolhos))

This draft document is being released for consultation on the species listing eligibility and conservation actions

The purpose of this consultation document is to elicit additional information to better understand the eligibility of the species for listing and inform conservation actions, further planning and the potential need for a Recovery Plan.

The draft assessment below should therefore be considered **tentative** at this stage, as it may change as a result of responses to this consultation process.

Note: Specific consultation questions relating to the below draft assessment and preliminary determination have been included in the consultation cover paper for your consideration.

This document combines the approved conservation advice and listing assessment for the subspecies. It provides a foundation for conservation actions and further planning.

Conservation status

Turnix varius scintillans (painted button-quail (Houtman Abrolhos)) is proposed to be transferred from the Vulnerable category to the Endangered category of the threatened species list under the *Environment Protection and Biodiversity Conservation Act 1999.*

T. v. scintillans was assessed by the Threatened Species Scientific Committee to be eligible for listing as Endangered under criterion 2 and 4. The Committee's assessment is at Attachment A. The Committee's assessment of the subspecies' eligibility against each of the listing criteria is:

- Criterion 1: Ineligible
- Criterion 2: B1ac(i,v)+B2ac(i,v): Endangered
- Criterion 3: Ineligible
- Criterion 4: D1: Endangered
- Criterion 5: Insufficient data

The main factor that appears to make the subspecies eligible for listing in the Endangered category is that the population is estimated to be very low (Barnes et al. 2021). There are estimated to be 500 (range 100–1,000, low reliability) mature painted button-quail (Houtman Abrolhos) in the wild (Barnes et al. 2021); however, the number of mature individuals fluctuates with rainfall at rates approaching an order of magnitude (Barnes et al. 2021). As recommended by the IUCN guidelines, where the population size fluctuates, a lower estimate should be used when estimating the number of mature individuals (IUCN Standards and Petitions Committee 2022). Barnes et al. (2021) state that the "population may sometimes fall below 250 mature

individuals." For the purpose of this assessment, the population of painted button-quail (Houtman Abrolhos) is estimated to be 250.

Barnes et al. (2021) estimate the painted button-quail (Houtman Abrolhos) extent of occurrence (EOO) to be 20 km^2 (range 18–112 km^2) and area of occupancy (AOO) to be 48 km^2 (range 40–52 km^2). However, as the EOO is lower than the AOO estimate, the EOO in this assessment has been increased to be the same as the AOO, as advised in the IUCN guidelines (IUCN Standards and Petitions Committee 2022). Both the EOO and AOO estimates have high reliability (Barnes et al. 2021).

The extirpation of the subspecies at North Island within the last decade is evidence of a range contraction, however the contraction is not continuing (Barnes et al. 2021). The subspecies breeds at two to three locations and its distribution is not severely fragmented (Barnes et al. 2021).

Species can also be listed as threatened under state and territory legislation. For information on the current listing status of this species under relevant state or territory legislation, see the Species Profile and Threats Database.

Species information

Taxonomy

Conventionally accepted as *Turnix varius scintillans* (Gould 1845).

Two subspecies are recognised, *T. v. varius* occurs widely from south-western to eastern mainland Australia. The closely related, and possibly extinct, *T. novaecaledoniae*, is now considered to be a separate species.

Description

The painted button-quail (Houtman Abrolhos), is a small (14–17 cm) terrestrial bird. Adults have upperparts that are mainly grey or brownish-grey, but are heavily marked with a combination of white, reddish-brown and black spots, blotches, bars and streaks, and a large reddish-brown patch on each shoulder (Marchant & Higgins 1993). Its underparts consist of a white chin and throat, a grey breast with buff spots, a white, buff-white or cream belly, and a buff to reddish-buff undertail. It has reddish-orange or (when breeding) red irises, a grey or brownish-grey bill, and yellow legs and feet (Marchant & Higgins 1993). The sexes are similar in appearance, but adult females are substantially brighter and somewhat larger than adult males (Storr & Johnstone 1984). Painted button-quail (Houtman Abrolhos) eggs are white or pale brown with brown, reddish-brown or dark brown spots, with some underlying grey (Storr 1965; Storr et al. 1986; Johnstone & Storr 1998).

Distribution

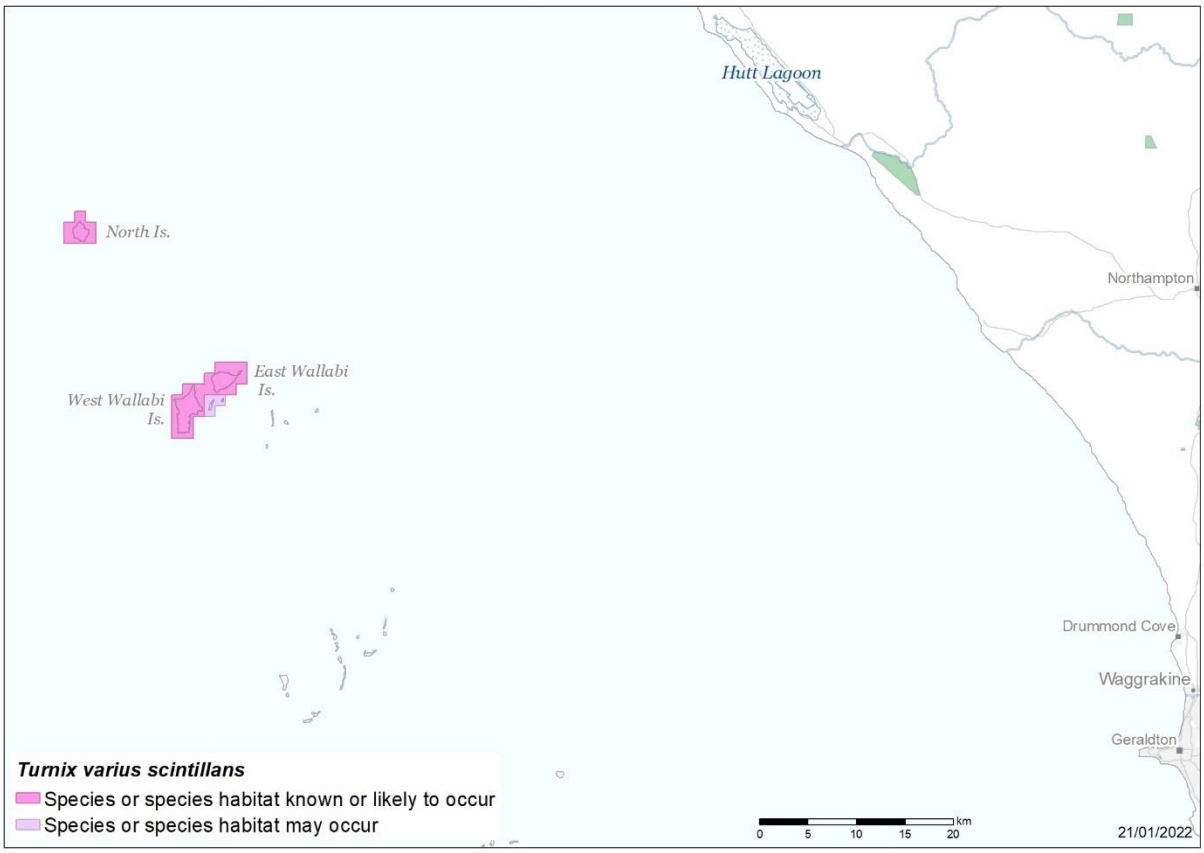
The painted button-quail (Houtman Abrolhos) is endemic to the Houtman Abrolhos archipelago (Storr 1965; Storr et al. 1986), which lies approximately 60 to 80 km off the western coast of Western Australia. The subspecies is known to breed on East Wallabi Island (321 ha) and West Wallabi Island (587 ha) (Barnes et al. 2021). Although birds have been recorded on four nearby islets: Oystercatcher (4.6 ha), Turnstone (1.4 ha), Seagull (7.7 ha) and the heavily modified Pigeon (4.3 ha), the subspecies appear not to be a resident there (Barnes et al. 2021). Painted

button-quail (Houtman Abrolhos) formerly occurred on North Island (181 ha), 18 km to the northwest, but a failure to find them there since 2005 despite searching suggests they were probably extirpated (Newell et al. 2017). Extirpation from North Island may also have occurred between 1913 and 1959 with subsequent natural recolonisation by the 1970s (DBCA 2018).

Numbers of painted button-quail (Houtman Abrolhos) likely vary seasonally (Barnes et al. 2021). Preliminary camera trap data on East Wallabi indicate that the distribution is patchy and localised to hotspots. A sand-bridge allows movement between East and West Wallabi Islands during low tide, but otherwise individuals are confined to their respective islands with little or no movement between them (Barnes et al. 2021).

Land tenure of the Abrolhos islands where the painted button-quail (Houtman Abrolhos) comprises the Houtman Abrolhos Islands National Park and Houtman Abrolhos Nature Reserve (Reserve no. 20253). The Minister for Fisheries is able to lease or license land use on the islands. Commercial fishers are the only users who have permission to live on the islands. In the Wallabi group there are settlements on Pigeon, Little Pigeon, West Wallabi and North islands. These settlements are managed by a Houtman Abrolhos Islands Bodies Corporate.

Map 1 Modelled distribution of painted button-quail (Houtman Abrolhos)



Source: Base map Geoscience Australia; species distribution data Species of National Environmental Significance database.
Caveat: The information presented in this map has been provided by a range of groups and agencies. While every effort has been made to ensure accuracy and completeness, no guarantee is given, nor responsibility taken by the Commonwealth for errors or omissions, and the Commonwealth does not accept responsibility in respect of any information or advice given in relation to, or as a consequence of, anything contained herein.
Species distribution mapping: The species distribution mapping categories are indicative only and aim to capture (a) the habitat or geographic feature that represents to recent observed locations of the species (known to occur) or habitat occurring in close proximity to these locations (likely to occur); and (b) the broad environmental envelope or geographic

region that encompasses all areas that could provide habitat for the species (may occur). These presence categories are created using an extensive database of species observations records, national and regional-scale environmental data, environmental modelling techniques and documented scientific research.

Relevant biology and ecology

Habitat

Painted button-quails (Houtman Abrolhos) can occur in all environments in the Houtman Abrolhos, except for limestone pavements associated with old guano mining facilities (DBCA 2018). The subspecies is most commonly observed in open grasslands of *Spinifex longifolius* on low sand dunes and open shrublands of *Atriplex cinerea* and *Halosarcia halocnemoides* on flats (Storr 1965; DBCA 2018). The subspecies also occurs in *Frankenia pauciflora* shrubland and dense thickets of *Nitraria*, and occasionally forages in the sub-littoral zone and around fishing camps (DBCA 2018).

Foraging ecology

The painted button-quail (Houtman Abrolhos) forages on the ground by scratching for seeds and insects in soil and loose sand with its feet (Storr 1965). While feeding, it creates distinctive circular depressions in the soil or leaf litter which are known as "platelets" (DBCA 2018). The painted button-quail (Houtman Abrolhos) also takes scraps from around fishing camps (Storr 1965).

Reproductive ecology

The subspecies' nest is a scrape in loose soil approximately 10 cm in diameter and 2 cm deep, lined with fine twigs and concealed from above by an overhanging bush or clump of spinifex (O'Loughlin 1965; Storr 1965; Storr et al. 1986; Johnstone & Storr 1998). A clutch of three eggs is laid, with laying occurring from April to October (Hall 1902; Storr 1965; Storr et al. 1986; Johnstone & Storr 1998).

The incubation and fledging periods are unknown but, based on the subspecies *T. v. varius* on mainland Australia, clutches are probably incubated for about 13 or 14 days (Carter 1923; Marchant & Higgins 1993; Johnstone & Storr 1998). Parental care in this subspecies is also unknown, but the mainland subspecies is polyandrous (each female breeds with several males), and the male incubates and rears the young (Frith 1969). The young are agile on hatching and quickly follow the male parent, who at first feeds them and then attends to the foraging chicks (Shephard 1989; Marchant & Higgins 1993).

No quantitative information is available on breeding success, but its habit of nesting on the ground renders the painted button-quail (Houtman Abrolhos) vulnerable to terrestrial predators. The carpet python (*Morelia spilota imbricata*), which occurs on East and West Wallabi and Seagull islands, is known to prey on the button-quail (Pearson et al. 2002), and the King's skink (*Egernia kingii*) is likely to eat its eggs. The house mouse (*Mus musculus*) has been introduced to North Island and may compete with the button-quails for food or eat their eggs or prey on young birds (DBCA 2018; DBCA 2021).

Movement pattern

Little is known about the behaviour of the painted button-quail (Houtman Abrolhos) except that it is usually seen in pairs (Johnstone & Storr 1998). The mainland subspecies is nocturnal and crepuscular with the females making low booming advertising calls, often at night (Marchant & Higgins 1993). Females respond aggressively to imitations of their booming call by giving rapid

drumming calls and walking about trying to find the intruder. When disturbed, they will freeze or run quickly in spurts with head carried high (DBCA 2018). When flushed they will fly at a height of a metre or two above the ground for some distance before dropping and running. They usually fly low but may fly up to 6 m above the ground and travel considerable distances, so it is also possible they fly from the Wallabi Group to North Island (18 km from the other islands) (S. Garnett, pers. comm., August 2017 cited in DBCA 2018).

Habitat critical to the survival

Habitat critical to the survival or important habitats of a species/subspecies or ecological community refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal;
- for the long-term maintenance of the species/subspecies or ecological community (including the maintenance of species/subspecies essential to the survival of the species/subspecies or ecological community, such as pollinators);
- to maintain genetic diversity and long-term evolutionary development; or
- for the reintroduction of sub-populations or recovery of the species/subspecies or ecological community.

The habitat that is critical to the survival of the painted button-quail (Houtman Abrolhos) includes:

- current area of occupancy of resident sub-populations of the subspecies: East and West Wallabi, and North islands; and
- other islands of the Houtman Abrolhos archipelago with similar habitat that may act as refuge locations for the subspecies, including Oystercatcher, Pigeon, Seagull and Turnstone islands.

Any breeding or foraging areas where the species is known or likely to occur and any newly discovered breeding or foraging locations should be considered habitat critical to the survival. Areas that are not currently occupied by the species, but which may become suitable in the future, should also be considered habitat critical to survival.

No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat.

Threats

Painted button-quail (Houtman Abrolhos) are among the five bird taxa thought most likely to go extinct in the next 20 years (Geyle et al. 2018). Currently, the principal existing threats seem to be the spread of the weeds golden crownbeard (*Verbesina encelioides*) and Paterson's curse (*Echium plantagineum*), which are capable of rendering the ground vegetation layer unsuitable habitat for the subspecies (DBCA 2018; Barnes et al. 2021).

On North Island, tammar wallabies (*Notomacropus eugenii derbianus*), grazed extremely heavily following their introduction for non-conservation purposes in 1985, resulting in major vegetation impacts, and reduced cover. These impacts are thought to have caused extirpation of painted button-quail (Houtman Abrolhos) from North Island (DBCA 2018), where the wallabies had no natural predators. However, wallabies coexist with the subspecies on the Wallabi group

where carpet pythons are predators of the wallabies are (How et al. 2020). An earlier introduction of the wallaby to North Island in the 1920s was also associated with loss of the button-quail, but the presence of cats (*Felis catus*), black rats (*Rattus rattus*) and house mice (*Mus musculus*), and two large fires in 1935 and about 1945, makes attribution of cause of the first button-quail extirpation event impossible, especially given that only the mice now survive (Storr 1965). Button-quail recolonised North Island naturally after the first, assumed, extirpation.

The introduction of either cats, rats, foxes or mice to the Wallabi group of islands is the major potential threat to the subspecies (DBCA 2018; Barnes et al. 2021). Although the East and West Wallabi islands are separated by water, the strait is sufficiently shallow and interspersed with islets that it could easily be crossed by swimming rats (Russell et al. 2008; RH Clarke unpublished cited in Barnes et al. 2021). The presence of a small settlement on West Wallabi Island and nearby islets may mean that invasive predators have had the opportunity to invade before; improvements in access to East Wallabi Island (McGowan & Dawson 2020) will increase the risk. However, the presence of carpet pythons, which occur at exceptionally high densities on West Wallabi Island (Pearson et al. 2002; RH Clarke unpublished cited in Barnes et al. 2021), may both constrain wallaby numbers and reduce the probability of successful mammal invasion.

Projected climate change impacts such sea-level rise and storm surge should not have an impact in the medium term (Rogers & Associates 2018), but rainfall, which is likely to precede pulses of recruitment, was 15% lower on the adjacent mainland at Geraldton in the last two decades than in the preceding 20 years. Low rainfall may impede recovery from disturbances (Barnes et al. 2021).

Table 1 Threats

Threats in Table 1 are noted in approximate order of highest to lowest impact, based on available evidence.

Threat	Status [a]	Evidence
Predation and competition by introduced fauna		
Introduction of black rats, cats and foxes	• Timing: current & future • Confidence: inferred • Likelihood: possible • Consequence: major • Trend: static • Extent: across part of its range	At present none of the islands that are occupied by the painted button-quail (Houtman Abrolhos) have introduced predators such as rats or cats (DBCA 2018; DBCA 2021). The introduction of a large predator to any of the occupied islands could have a catastrophic effect on the painted button-quail (Houtman Abrolhos) population through both predation and competition for food (DBCA 2018). The black rat (*Rattus rattus*) is considered the worst rodent threat on Australian islands (DEWHA 2009a) and if introduced to any of East or West Wallabi or North islands is highly likely to cause the local extinction of the button-quail through predation of eggs and competition for food resources. The black rat was discovered on Pigeon Island in 1965 by an Aquinas College expedition (O'Loughlin 1965). From Pigeon Island, the rats could have easily invaded both West and East Wallabi islands as they are adept

Threat	Status [a]	Evidence
		swimmers and will cross channels hundreds of metres in width (DEWHA 2009a). The rats were eradicated from Pigeon Island (Burbidge 2004) and have not been detected on East or West Wallabi islands. There are currently no cats or foxes on any of the Abrolhos islands, but both species have played a major role in the decline of other ground-nesting birds (DEWHA 2008b; DoE 2015), including nesting seabirds on Rat Island (in the Easter Group, Abrolhos) where black rats and cats were introduced in the early 1900s (Storr et al. 1986). Storr (1960) recorded the presence of two domestic cats that had gone wild on North Island in 1959, but they did not establish a population on the island. He proposed that they were a factor in the then decline of the button-quail on the island.
House mouse predation and competition	• Timing: current & future • Confidence: suspected • Likelihood: possible • Consequence: moderate • Trend: increasing • Extent: across part of its range •	The house mouse was introduced to North Island in the 1970s, presumably from the fishing camps on the island, and is still likely to be present (DBCA 2018; DBCA 2021), although its distribution and abundance is unknown (DBCA 2021). Impacts of the house mouse on the button-quail are unknown, although it seems likely they would compete for food (e.g., seeds and invertebrates) and may eat eggs or prey upon young birds (DBCA 2018). On Southern Ocean islands, it has been found that where mice are the only introduced rodent, they have more severe impacts including predation on seabird eggs and chicks (Angel et al. 2009).
Habitat modification and degradation		
Golden crownbeard and Paterson's curse altering native habitat	• Timing: current & future • Confidence: observed • Likelihood: almost certain • Consequence: major • Trend: static • Extent: across the entire range	Invasive exotic weeds are a key threat to the painted button-quail (Houtman Abrolhos), with populations susceptible to rapid decline or local extinction if they do not have access to suitable habitat (Barnes et al. 2021). The invasive weed species golden crownbeard and Paterson's curse were introduced to East Wallabi Island in gravel used for airstrip repairs in 1998 (DBCA 2018). The golden crownbeard has since been found on North and Rat islands as well. Control measures to date have prevented their spread (DBCA 2018). The golden crownbeard and Paterson's curse are of significant concern as both species are serious environmental weeds that could potentially invade and displace the native vegetation on the islands (Barnes et al. 2021). Both species also produce large amounts of seeds that can germinate at any time of year. Patterson's curse seeds may remain dormant in the soil for >5 years (AV 2020) while golden crownbeard seedbank persistence is 2-3 years (WAH 1998). They can also form dense monotypic stands,

Threat	Status [a]	Evidence
		particularly in disturbed sandy areas (Brown & Bettink 2016).
Habitat degradation caused by tammar wallaby grazing	• Timing: current • Confidence: observed • Likelihood: unlikely • Consequence: major • Trend: decreasing • Extent: across part of its range	On North Island, it is likely that the population of painted button-quail is locally extinct as a result of habitat destruction following the introduction of the tammar wallaby (DBCA 2018). The tammar wallaby occurs naturally on East and West Wallabi islands and was thought to be originally introduced to North Island in the 1920s. Prior to this, the tammar wallaby had not been recorded on North Island (Stokes 1846 cited in Storr 1960). The North Island population of tammar wallabies increased to over 450 in the early 2000s and vegetation surveys showed a significant impact on the vegetation of the island from overgrazing, ringbarking, and trampling, resulting in reduced cover, reduced plant recruitment and spread of sand drifts (DBCA 2021). Trials of various control methods (fertility control, shooting and translocating tammar wallabies off North Island) between 2005 and 2008, reduced the population to 50-70 animals (DBCA 2021). These trials stopped in 2008 and the population increased to about 1000 animals by 2012. No button-quail were found on North Island during surveys in 2013 and 2017, leading to the suggestion they may be locally extinct (DBCA 2021). A control program was reinstated in 2018 and regular control since then has reduced tammar wallaby numbers dramatically (DBCA 2021). This control will continue until the tammar wallaby is eradicated from North Island. Once this has occurred, the reintroduction of button-quails to North Island will be considered (DBCA 2021).
Fire		
Inappropriate fire regimes	• Timing: current & future • Confidence: projected • Likelihood: possible • Consequence: major • Trend: static • Extent: across the entire range	A major fire event could have a significant impact on the button-quail through loss of habitat until the vegetation recovers (DBCA 2018; Barnes et al. 2021). If all or most of an island is burnt, the button-quail population on that island would likely significantly decline or become locally extinct. There have been two fires recorded in the eastern dunes of North Island, one in October 1935 and another in about 1945 (Storr 1960). Following these fires, the vegetation was slow to recover, and large sand blowouts formed. It appears that the button-quail population on North Island declined significantly after 1945, as Storr (1960) did not see them on the island in 1959. However, it is unknown whether this decline was related to the fires or to the introduction of non-endemic fauna (tammar wallabies and cats) over the same time period.

Threat	Status [a]	Evidence
		In the event of a bushfire occurring, it is unlikely that resources could be deployed from the mainland in time to effectively suppress it (DBCA 2021). Fire prevention is therefore the best tool available for managing the risk of bushfire on the islands (DBCA 2021).
Land use and development		
Tourism and recreation	• Timing: current & future • Confidence: suspected • Likelihood: possible • Consequence: moderate • Trend: increasing • Extent: across the entire range	Land use and development of the islands that the painted button-quail (Houtman Abrolhos) occur on has the potential to impact the subspecies through direct disturbance of the birds, impacts on their habitat or the introduction of non-endemic fauna or flora (DBCA 2018; DBCA 2021). It is expected that recreation and tourism in the Abrolhos islands will increase in the future (DoF 2012; DBCA 2021). Recreation activities currently include boating, fishing, diving and wildlife and heritage photography and appreciation. There is public infrastructure (airstrip, helipad, jetty, public boat moorings, boardwalks and toilet facilities) on East Wallabi as it is one of the main islands that is visited, in particular with the growing industry of air charter tours. There is currently no public accommodation on the islands, although options are being considered on East Wallabi. It will be important that any change in recreational use of these islands carefully considers potential impacts on the button-quail.
Climate change and severe weather impacts		
Increase frequency or length of drought and/or stronger cyclones or storms	• Timing: current & future • Confidence: projected • Likelihood: almost certain • Consequence: moderate • Trend: increasing • Extent: across the entire range	The Abrolhos islands have a Mediterranean climate, with warm dry summers and cool, wet winters. Long term climate projections for Western Australia suggest the already variable climate will become more variable with wet years likely to become less frequent and dry years (drought) likely to become more frequent (DAF 2015; CSIRO 2020). Rainfall likely precedes pulses of recruitment (Barnes et al. 2021), therefore increases in drought will impact breeding success and the number of mature individuals. The frequency and intensity of storms is also likely to increase (CSIRO 2020). As the button-quail is restricted to small islands, it would be susceptible to declines or local extinctions due to extremes in climatic conditions (i.e.. storms or droughts).
Sea level rise	• Timing: current & future • Confidence: projected • Likelihood: possible • Consequence: moderate • Trend: increasing • Extent: across the entire range	With the changing climate it is also predicted that there could be a sea level rise in WA of 24 cm by 2050 (CSIRO 2020). Most of the islands in the Wallabi group do not exceed 2 m in elevation, though parts of East and West Wallabi and North island are up to 15 m in elevation (Harvey et al. 2001). Therefore, a rise in sea level could have a

Threat	Status [a]	Evidence
		significant impact on these islands and could result in loss of button-quail habitat, however this sea-level rise and storm surge should not have an impact in the medium term (Rogers and Associates 2018), but rainfall, which is likely to precede pulses of recruitment, was 15% lower on the adjacent mainland at Geraldton in the last two decades than in the previous 20 years and may impede recovery from shocks.

[a]Timing—identifies the temporal nature of the threat
Confidence—identifies the nature of the evidence about the impact of the threat on the species
Likelihood—identifies the likelihood of the threat impacting on the whole population or extent of the species
Consequence—identifies the severity of the threat
Trend—identifies the extent to which it will continue to operate on the species
Extent—identifies its spatial context in terms of the range of the species

Each threat has been described in Table 1 in terms of the extent that it is operating on the species. The risk matrix (Table 2) provides a visual depiction of the level of risk being imposed by a threat and supports the prioritisation of subsequent management and conservation actions. In preparing a risk matrix, several factors have been taken into consideration, they are: the life stage they affect; the duration of the impact; the spatial extent, and the efficacy of current management regimes, assuming that management will continue to be applied appropriately. The risk matrix and ranking of threats has been developed using available literature.

Table 2 Risk Matrix

Likelihood	Consequences				
	Not significant	**Minor**	**Moderate**	**Major**	**Catastrophic**
Almost certain		Sea level rise Increase frequency or length of drought and/or stronger cyclones or storms			
Likely				Golden crownbeard and Paterson's curse altering native habitat	
Possible			House mouse predation and competition Tourism and recreation	Increase in frequency, scale or intensity of fire	Introduction of black rats, cats and foxes
Unlikely				Habitat degradation caused by tammar wallaby browsing	
Unknown					

Risk Matrix legend/Risk rating:

Low Risk	Moderate Risk	High Risk	Very High Risk

Categories for likelihood are defined as follows:
Almost certain – expected to occur every year
Likely – expected to occur at least once every five years
Possible – might occur at some time
Unlikely –known to have occurred only a few times
Unknown – currently unknown how often the threat will occur
Categories for consequences are defined as follows:
Not significant – no long-term effect on individuals or populations
Minor – individuals are adversely affected but no effect at population level
Moderate – population recovery stable or declining
Major – population decline is ongoing
Catastrophic – population trajectory close to extinction

Priority actions have then been developed to manage the threats, particularly where the risk was deemed to be 'very high' (red shading) or 'high' (orange shading). For those threats with an unknown or low risk (blue and green shading respectively) research and monitoring actions have been developed to understand and evaluate the impact of the threats, where appropriate.

Conservation and recovery actions

Primary conservation objective

- By 2032, painted button-quail (Houtman Abrolhos) population maintained on Wallabi Islands resulting in a stable or increasing trend in number of mature individuals.
- By 2032, painted button-quail (Houtman Abrolhos population restored to North Island.

Conservation and management priorities

Introduction of black rats and cats

- Ensure strong quarantine protocols and invasion monitoring in place at all islands, including North Island to prevent rodent and cat invasion.
- Develop and implement a contingency plan for the control and eradication of introduced rats or cats on the islands.

Golden crownbeard and Paterson's curse altering native habitat

- Continue ongoing weed control with the aim to eradicate golden crownbeard and Paterson's Curse.

Increase in frequency, scale or intensity of fire

- Develop and implement a suitable fire management strategy to prevent of ignitions and advance measures to limit spread of fires within the Houtman Abrolhos archipelago where the subspecies occurs.
- Provide maps of known occurrences to local fire services.
- Prohibit the lighting of fires by all visitors to the islands.

Habitat degradation caused by tammar wallaby browsing

- Continue Tammar wallabies monitoring and eradication program on North Island.
- Once wallabies completely removed, undertake translocation of the painted button-quail (Houtman Abrolhos) to North Island if deemed feasible.

House mouse predation and competition

- Develop and implement a management plan for the control and eradication of the introduced house mice on the islands.

Tourism and recreation

- Clearly define pedestrian access (boardwalk, beach or walking trail).
- Considerer tourism developments only where there are minimal impacts to the subspecies or where impacts can be mitigated.

Stakeholder engagement/community engagement

- Improve community and visitor education and understanding of painted button-quail conservation.

- Provide public information to visitors highlighting the impacts of fire on habitat values and visitor safety. Campers should be required to bring their own enclosed flame gas cookers.
- Educate visitors on sensitive values, access, and appropriate behaviour via pre-visit information, commercial tour operator guidelines and interpretation products and experiences.

Survey and monitoring priorities

- Continue regular surveys to determine the presence/abundance and distribution patterns of the subspecies.
- Monitor the condition and extent of vegetation on islands where painted button-quail (Houtman Abrolhos) is or was present.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.

Information and research priorities

- Continue research on painted button-quail (Houtman Abrolhos) abundance, habitat use, distribution, taxonomy and monitoring methods.
- Determine the population size of the subspecies on the Wallabi Islands.
- Improve understanding of the ecology of the button-quail, particularly the relationship with native rats and carpet snakes.
- Determine impacts of predation by and competition with the house mouse.
- Investigate use of biological control agent program for golden crownbeard and Paterson's curse.
- Identify efficient techniques for monitoring the impacts of visitation and climate change on the subspecies.
- Use climate modelling techniques to investigate the potential impact of climate change on the subspecies and its habitat critical for survival.

Links to relevant implementation documents

- Houtman Abrolhos Islands National Park draft management plan 2021 (DBCA 2021).
- Threat abatement plan to reduce the impacts of exotic rodents on biodiversity on Australian offshore islands of less than 100,000 hectares (DEWHA 2009).
- Threat abatement plan for predation by the European red fox (DEWHA 2008b).
- Threat abatement plan for predation by feral cats (DoE 2015).
- Threat abatement plan for competition and land degradation by rabbits (DOEE 2016).
- Threat abatement plan for competition and land degradation by unmanaged goats (DEWHA 2008a).
- Policy Statement No. 35 Conserving threatened species and ecological communities (Parks & Wildlife 2015).

Conservation Advice and Listing Assessment references

Angel A, Wanless RM, Cooper J (2009) Review of impacts of the introduced house mouse on islands in the Southern Ocean: Are mice equivalent to rats?, *Biological Invasions* 11, 7, 1743–1754.

AV (2020) Agriculture Victoria - Paterson's curse. Available at: https://agriculture.vic.gov.au/biosecurity/weeds/priority-weeds/patersons-curse.

Barnes M, Desmond A, Carter R, Newell J, Davis R, Clarke RH, Burbidge AH, Garnett ST (2021) Houtman Abrolhos Painted Button-quail *Turnix varius scintillans*. In *The Action Plan for Australian Birds 2020* (Eds ST Garnett and GB Baker). CSIRO Publishing, Melbourne.

Bird JP, Martin R, Akçakaya HR, Gilroy J, Burfield IJ, Garnett ST, Symes A, Taylor J, Şekercioğlu ÇH, Butchart SHM (2020) Generation lengths of the world's birds and their implications for extinction risk. *Conservation Biology* 34, 1252–1261.

Brown K, Bettink K (2016) Swan Weeds: Management Notes. Florabase - The Western Australian Flora. Department of Biodiversity, Conservation and Attractions. Available at: https://florabase.dpaw.wa.gov.au/projects/swanweeds/.

Burbidge AA (2004) Introduced Mammals on Western Australian Islands: Improving Australia's Ability to Protect its Island Habitats from Feral Animals. Department of Conservation and Land Management, Western Australia. Available at: https://www.awe.gov.au/biosecurity-trade/invasive-species/publications/introduced-mammals-western-australian-islands.

Carter T (1923) Birds of the Broome Hill district. *Emu* 23, 125–142.

Davis RA, Carter R, Burbidge AH (2020) 'Report on the first trial of remote camera monitoring for the Abrolhos Painted Button-quail (*Turnix varius scintillans*)'. Unpublished report to DBCA Midwest Region, Perth.

DBCA (2018) Abrolhos Painted Button-Quail (*Turnix varius scintillans*) Interim Recovery Plan. Department of Biodiversity, Conservation and Attractions, Perth.

DBCA (2021) Houtman Abrolhos Islands National Park draft management plan, 2021. Department of Biodiversity, Conservation and Attractions, Perth.

DoE (2015) Threat Abatement Plan for Predation by Feral Cats. Department of the Environment, Commonwealth of Australia, Canberra.

DOEE (2016) Threat Abatement Plan for Competition and Land Degradation by Rabbits. Department of the Environment and Energy, Canberra.

DEWHA (2008a) Threat Abatement Plan for Competition and Land Degradation by Unmanaged Goats. Department of the Environment, Water, Heritage and the Arts, Canberra.

DEWHA (2008b) Threat Abatement Plan for Predation by the European Red Fox. Department of the Environment, Water, Heritage and the Arts, Canberra.

DEWHA (2009) Threat abatement plan to reduce the impacts of exotic rodents on biodiversity on Australian offshore islands of less than 100 000 hectares. Commonwealth of Australia.

Ford HA, Bell H (1982) Density of birds in eucalypt woodland affected to varying degrees by dieback. Emu 81, 202–208.

Frith HJ (1969) *Birds in the Australian High Country*. A. H. & A. W. Reed, Sydney.

Geyle HM, Woinarski JC, Baker GB, Dickman CR, Dutson G, Fisher DO, Ford H, Holdsworth M, Jones ME, Kutt A, Legge S, Leiper I, Loyn R, Murphy BP, Menkhorst P, Reside AE, Ritchie EG, Roberts FE, Tingley R, Garnett ST (2018) Quantifying extinction risk and forecasting the number of impending Australian bird and mammal extinctions. Pacific Conservation Biology 24, 157–167.

Gutiérrez-Expósito C, García-Gorria R, Qninba A, Clavero M, Revilla E (2019) The farmland refuge of the last Andalusian button quail population. Global Ecology and Conservation 17, e00590.

Hall R (1902) On a collection of birds from Western Australia. *Ibis* 8, 2, 121–206.

Harvey JM, Alford JJ, Longman VM, Keighery GJ (2001) A flora and vegetation survey of the islands of Houtman Abrolhos, Western Australia', *CALMScience* 3, 4, 521–623.

How RA, Cowan MA, Teale RJ, Schmitt LH (2020) Environmental correlates of reptile variation on the Houtman Abrolhos archipelago, eastern Indian Ocean. Journal of Biogeography. doi:10.1111/jbi.13881.

IUCN Standards and Petitions Committee (2022) Guidelines for Using the IUCN Red List Categories and Criteria. Version 15. Prepared by the Standards and Petitions Committee. Available at: https://www.iucnredlist.org/documents/RedListGuidelines.pdf.

Johnstone RE, Storr GM (1998) *Handbook of Western Australian Birds. Volume I - Non-Passerines (Emu to Dollarbird).* Western Australian Museum, Perth.

Marchant S, Higgins PJ (eds) (1993) *Handbook of Australian, New Zealand and Antarctic Birds*. Volume 2: Raptors to Lapwings. Oxford University Press, Melbourne

McGowan M, Dawson S (2020) Historic day for WA as Houtman Abrolhos Islands National Park officially created. Government of Western Australia, <https://www.mediastatements.wa.gov.au/Pages/McGowan/2019/07/Historic-dayfor-WA-as-Houtman-Abrolhos-Islands-National-Park-officially-created.aspx>.

Newell J, Gray M, Desmond A (2017) Surveying for the Abrolhos Painted Button-quail. Western Australian Bird Notes 164, 27–28.

O'Loughlin PM (1965) *Aquinas College Second Expedition to Wallabi Islands of Houtman's Abrolhos*. Aquinas College, Manning, Western Australia.

Parks and Wildlife (2015) Corporate Policy Statement No. 35: Conserving Threatened Species and Ecological Communities. Department of Parks and Wildlife, Perth, Western Australia.

Pearson D, Shine R, How R (2002) Sex-specific niche partitioning and sexual size dimorphism in Australian pythons (*Morelia spilota imbricata*). Biological Journal of the Linnean Society 77, 113–125.

Rogers MP and Associates (2018) 'Coastal Hazard Assessment of Islands in the Northern Agricultural Region'. Report to Northern Agricultural Catchment Council, Geraldton.

Russell JC, Towns DR, Clout MN (2008) 'Review of rat invasion biology: Implications for island biosecurity'. Department of Conservation, Wellington, New Zealand.

Shephard M (1989) Aviculture in Australia: Keeping and Breeding Aviary Birds. Black Cockatoo Press, Victoria.

Storr, G. M. (1960) 'The Physiography, vegetation and vertebrate fauna of North Island, Houtman Abrolhos', Journal of the Royal Society of Western Australia, 43, pp. 59–62.

Storr GM (1965) The physiography, vegetation and vertebrate fauna of the Wallabi group, Houtman Abrolhos. Journal of the Royal Society of Western Australia 48, 1–14.

Storr GM, Johnstone RE (1984) Subspecific status of the painted button-quail of the Houtman Abrolhos, Western Australia. *Records of the Western Austalian Museum* 11, 3, 315.

Storr GM, Johnstone RE, Griffin P (1986) Birds of the Houtman Abrolhos, Western Australia. Records of the Western Australian Museum Supplement 24, 29–30.

WAH (1998) Western Australian Herbarium Florabase—the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. Available at: https://florabase.dpaw.wa.gov.au/.

The Threatened Species Scientific Committee finalised this assessment on DD Month Year.

Attachment A: Listing Assessment for *Turnix varius scintillans*

Reason for assessment

This assessment follows provision of new information.

Assessment of eligibility for listing

This assessment uses the criteria set out in the EPBC Regulations. The thresholds used correspond with those in the IUCN Red List criteria except where noted in criterion 4, sub-criterion D2. The IUCN criteria are used by Australian jurisdictions to achieve consistent listing assessments through the Common Assessment Method (CAM).

Key assessment parameters

Table 3 includes the key assessment parameters used in the assessment of eligibility for listing against the criteria. The definition of each of the parameters follows the Guidelines for Using the IUCN Red List Categories and Criteria.

Table 3 Key assessment parameters

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Number of mature individuals	250	100	1000	In small areas of suitable habitat under good conditions for detection, pairs were encountered approximately every 200 m in February 2020 (R Clarke, N Jackett Unpublished cited in Barnes et al. 2021), a density similar to that found by Ford and Bell (1982) who estimated density of T. *v. varius* at 1/ha in degraded forest. However, densities can be much lower than this. In contrast, Davis et al. (2020) had five personnel cover the entire of East Wallabi walking transects on 17 Jan 2020 to deploy cameras and only flushed five individuals – two sightings of which were pairs. Population estimates are the average of the extreme values derived from these densities. The reliability of this estimate is low (Barnes et al. 2021)
Trend	Declining			Barnes et al. (2021). The reliability of this estimate is high (Barnes et al. 2021).
Generation time (years)	3.2	2.4	4.0	Bird et al. (2020). The reliability of this estimate is low (Barnes et al. 2021).

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Extent of occurrence	48 km²	40 km²	112 km²	Barnes et al. (2021) calculated the EOO to be 20 km² (range 18–112 km²). As the EOO is lower than the AOO estimate, the EOO in this assessment has been increased to be the same as the AOO, as recommended in the IUCN guidelines (IUCN Standards and Petitions Committee 2022).
Trend	Contracting			Barnes et al. (2021)
Area of Occupancy	48 km²	40 km²	52 km²	The AOO is the number of occupied 2x2 km squares, which includes sea so exceeds both land area and EOO (Barnes et al. 2021). The reliability of this estimate is high (Barnes et al. 2021).
AOO is a standardised spatial measure of the risk of extinction, that represents the area of suitable habitat known, inferred or projected to be currently occupied by the taxon. It is estimated using a 2 x 2 km grid to enable comparison with the criteria thresholds. The resolution (grid size) that maximizes the correlation between AOO and extinction risk is determined more by the spatial scale of threats than by the spatial scale at which AOO is estimated or shape of the taxon's distribution. It is not a fine-scale estimate of the actual area occupied. In some cases, AOO is the smallest area essential at any stage to the survival of existing populations of a taxon (e.g., breeding sites for migratory species).				
Trend	Contracting			Barnes et al. (2021). The reliability of this estimate is high (Barnes et al. 2021).
Number of subpopulations	1	1	1	Barnes et al. (2021)
Basis of assessment of subpopulation number	All remaining islands where the birds are present are within 1 km of each other and North Island, 18 km, has probably been naturally recolonised once already (Barnes et al. 2021).			
No. locations	2	1	>10	TSSC pers. comm. (4 April 2022); Barnes et al. (2021)

Metric	Estimate used in the assessment	Minimum plausible value	Maximum plausible value	Justification
Trend	Not calculated			Barnes et al. (2021)
Basis of assessment of location number	Painted button-quail (Houtman Abrolhos) is estimated to occur at two locations, based on the most plausible serious threats impacting the breeding locations – introduction of invasive predators and climate change impacts (Barnes et al. 2021; IUCN Standards and Petitions Committee 2022; TSSC pers comms. 4 April 2022). The Abrolhos group of islands are currently free of black rats and cats, and at these sites invasive predators are not considered an immediate threat. However, the risk of alien introductions is always present, particularly where islands are visited regularly by humans. The small populations of Painted button-quail (Houtman Abrolhos), in particular, could be immediately threatened if the predator-free status of important breeding sites were lost. Painted button-quail (Houtman Abrolhos) is endemic to seven islands of the Abrolhos, which lies approximately 60 to 80 km off the western coast of Western Australia (DBCA 2018). The subspecies is only known to breed on two islands of this archipelago: East Wallabi Island and West Wallabi Island of the Wallabi group of islands (Barnes et al. 2021). The subspecies formerly occurred on North Island, but a failure to find them there since 2005 despite searching suggests they were probably extirpated (Newell et al. 2017). The subspecies has also been recorded on four small islets: Oystercatcher, Turnstone, Seagull and Pigeon Islands (DBCA 2018; Barnes et al. 2021). Given the widespread distribution of the subspecies (Map 1) and current quarantine and monitoring measures in place, it is unlikely that a single predator introduction would extirpate all individuals within a period of three years (Barnes et al. 2021).			
Fragmentation	Not severely fragmented (Barnes et al. 2021).			
Fluctuations	Not subject to extreme fluctuations in EOO, AOO, number of subpopulations or locations Barnes et al. (2021). The number of mature individuals probably fluctuates with rainfall at rates approaching an order of magnitude (Barnes et al. 2021).			

Criterion 1 Population size reduction

Reduction in total numbers (measured over the longer of 10 years or 3 generations) based on any of A1 to A4			
	Critically Endangered Very severe reduction	**Endangered Severe reduction**	**Vulnerable Substantial reduction**
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3, A4	≥ 80%	≥ 50%	≥ 30%

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.

A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(*a) cannot be used for A3*]

A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

Based on any of the following

(a) direct observation [except A3]

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Criterion 1 evidence

Not eligible

There are currently estimated to be 250 (range 100–1,000, low reliability) painted button-quail (Houtman Abrolhos) in the wild, with a declining trend (high reliability) (Barnes et al. 2021). The subspecies' EOO is estimated at 48 km^2 (range 40–112 km^2, high reliability) and AOO at 48 km^2 (range 40–52 km^2, high reliability) (Barnes et al. 2021). Barnes et al. (2021) state that while the population of painted button-quail (Houtman Abrolhos) is declining, the rate of decline has not reached a rate approaching 30% in the last ten years (generation time 3.2 years) (Barnes et al. 2021).

The data presented above appear to demonstrate the subspecies is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the subspecies' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 2 Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy

		Critically Endangered Very restricted	Endangered Restricted	Vulnerable Limited
B1.	Extent of occurrence (EOO)	**< 100 km²**	**< 5,000 km²**	**< 20,000 km²**
B2.	Area of occupancy (AOO)	**< 10 km²**	**< 500 km²**	**< 2,000 km²**
AND at least 2 of the following 3 conditions:				
(a)	Severely fragmented OR Number of locations	**= 1**	**≤ 5**	**≤ 10**
(b)	Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c)	Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

Criterion 2 evidence

Eligible under Criterion 2 B1ac(i,v)+B2ac(i,v) **for listing as** Endangered

Barnes et al. (2021) estimate the painted button-quail (Houtman Abrolhos) extent of occurrence (EOO) to be 20 km² (range 18–112 km²) and area of occupancy (AOO) to be 48 km² (range 40–52 km²). However, as the EOO is lower than the AOO estimate, the EOO in this assessment has been increased to be the same as the AOO, as advised in the IUCN guidelines (IUCN Standards and Petitions Committee 2022). Both the EOO and AOO estimates have high reliability (Barnes et al. 2021).

The subspecies is estimated to occur at two locations (range 1–>10; Table 4) but is not severely fragmented (Barnes et al. 2021). The extirpation of the subspecies at North Island within the last decade is evidence of contraction, however the contraction is not estimated to be continuing (Barnes et al. 2021). The painted button-quail (Houtman Abrolhos) is subject to extreme fluctuations in the number of mature individuals (TSSC pers. comms. 4 April 2022). The subspecies is not subject to extreme fluctuations in EOO, AOO, number of subpopulations or locations (Barnes et al. 2021).

The data presented above appear to demonstrate the subspecies is **eligible for listing as Endangered** under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the subspecies' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 3 Population size and decline

	Critically Endangered Very low	Endangered Low	Vulnerable Limited
Estimated number of mature individuals	**< 250**	**< 2,500**	**< 10,000**
AND either (C1) or (C2) is true			
C1. An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future)	**Very high rate 25% in 3 years or 1 generation (whichever is longer)**	**High rate 20% in 5 years or 2 generation (whichever is longer)**	**Substantial rate 10% in 10 years or 3 generations (whichever is longer)**
C2. An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at least 1 of the following 3 conditions:			
(a) (i) Number of mature individuals in each subpopulation	**≤ 50**	**≤ 250**	**≤ 1,000**
(a) (ii) % of mature individuals in one subpopulation =	**90 – 100%**	**95 – 100%**	**100%**
(b) Extreme fluctuations in the number of mature individuals			

Criterion 3 evidence

Not eligible

Barnes et al. (2021) estimated there to be 550 (range 100–1,000, low reliability) painted button-quail (Houtman Abrolhos) in the wild, however, the number of mature individuals fluctuates with rainfall at rates approaching an order of magnitude (Barnes et al. 2021). As recommended by the IUCN guidelines, where the population size fluctuates, a lower estimate should be used when estimating the number of mature individuals (IUCN Standards and Petitions Committee 2022). Barnes et al. (2021) state that the "population may sometimes fall below 250 mature individuals." For the purpose of this assessment, the population of painted button-quail (Houtman Abrolhos) is estimated to be 250.

The population of painted button-quail (Houtman Abrolhos) has declined following the extirpation of birds on North Island (indicating a contraction); however species experts estimate that the decline is not continuing (Barnes et al. 2021). This is because the threats of invasive species (grazing by tammar wallaby, predation by black rats and cats) are being actively managed with control measures and eradication plans in place (DBCA 2018; Barnes et al. 2021; DBCA 2021). There is estimated to be one subpopulation containing 100% of mature individuals (Barnes et al. 2021). The number of mature individuals probably fluctuates with rainfall at rates approaching an order of magnitude (Barnes et al. 2021).

The data presented above appear to demonstrate the subspecies is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the subspecies' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 4 Number of mature individuals

	Critically Endangered Extremely low	Endangered Very Low	Vulnerable Low
D. Number of mature individuals	< 50	< 250	< 1,000
D2.[1] *Only applies to the Vulnerable category* Restricted area of occupancy or number of locations with a plausible future threat that could drive the species to critically endangered or Extinct in a very short time			D2. Typically: area of occupancy < 20 km^2 or number of locations ≤ 5

[1] The IUCN Red List Criterion D allows for species to be listed as Vulnerable under Criterion D2. The corresponding Criterion 4 in the EPBC Regulations does not currently include the provision for listing a species under D2. As such, a species cannot currently be listed under the EPBC Act under Criterion D2 only. However, assessments may include information relevant to D2. This information will not be considered by the Committee in making its recommendation of the species' eligibility for listing under the EPBC Act, but may assist other jurisdictions to adopt the assessment outcome under the *common assessment method*.

Criterion 4 evidence

Eligible under Criterion 4 D1 for listing as Endangered

There are estimated to be 550 (range 100–1,000) mature painted button-quails (Houtman Abrolhos) individuals in the wild, however the reliability of this estimate is low (Barnes et al. 2021). Barnes et al. (2021) state that the population of painted button-quails (Houtman Abrolhos) probably varies seasonally, and it is likely that the population may sometimes fall below 250 mature individuals. Where the population size fluctuates, the IUCN guidelines recommend a lower estimate should be used when estimating the number of mature individuals under Criterion 4 (IUCN Standards and Petitions Committee 2022). For the purpose of this assessment, species experts estimate the population of painted button-quail (Houtman Abrolhos) to be <250 mature individuals (Barnes et al. 2021).

The data presented above appear to demonstrate the subspecies is **eligible for listing as Endangered** under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the subspecies' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Criterion 5 Quantitative analysis

	Critically Endangered **Immediate future**	**Endangered** **Near future**	**Vulnerable** **Medium-term future**
Indicating the probability of extinction in the wild to be:	≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)	≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)	≥ 10% in 100 years

Criterion 5 evidence

Insufficient data to determine eligibility

Population viability analysis appears not to have been undertaken for the painted button-quail (Houtman Abrolhos). Therefore, there is insufficient data to demonstrate if the subspecies is eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the subspecies' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Adequacy of survey

The survey effort has been considered adequate and there is sufficient scientific evidence to support the assessment.

Listing and Recovery Plan Recommendations

A decision about whether there should be a Recovery Plan for this subspecies has not yet been made. The purpose of this consultation document is to elicit additional information to help inform the decision.

Cataloguing data

This publication (and any material sourced from it) should be attributed as: Department of Agriculture, Water and the Environment 2022, *Conservation Advice for painted button-quail* (Houtman Abrolhos), Canberra. 

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