DRAFT National Risk Assessment: EXTREME

RISK ASSESSMENT FOR AUSTRALIA: Patagonian mara (*Dolichotis patagonum*)

Class - Mammalia, **Order** - Rodentia, **Family** - Caviidae, **Genus** - *Dolichotis*.

SPECIES: *Dolichotis patagonum* (Zimmerman, 1780) **Synonyms:** *Cavia patagonum* (Zimmerman, 1780) *Cavia magellanica* (Kerr, 1792) *Cavia patachonica* (Shaw, 1801) *Mara magellanica* (Lesson, 1830) *Dolichotis patagona patagona* (Zimmerman, 1780) *Dolichotis patagona centricola* (Thomas, 1902) *Dolichotis magellanicus centricola* (Thomas, 1902) **Subspecies:** *Dolichotis patagonum patagonum* (Zimmerman, 1780) *Dolichotis patagonum centricola* (Thomas, 1902) **Common names:** Patagonian Mara Patagonian Cavy Patagonian Hare	**Species description:** The Patagonian mara is a distinctive rodent, endemic to central and southern Argentina, spanning latitudes from approximately 28 to 50 degrees south (Honacki et al., 1982). It is the second-largest member of the Caviidae family, after the capybara (*Hydrochoerus hydrochaeris)* (Judas, 2023). Patagonian mara have a total length between 610 to 810 millimetres and weigh on average 8 kilograms. (Redford and Eisemberg, 1992; Macdonald et al., 2007; Mascow, 2011). Males are often larger in size and heavier than females (Mascow, 2011). It exhibits a unique morphology that blends features of lagomorphs, caviomorphs and ungulates (Genest and Dubost, 1974). The Patagonian mara has a similar appearance to the jackrabbit, with long, upright ears, short tail, long limbs and elongated, muscular hind limbs that are longer than the forelimbs. The head and ears are large in comparison to the body. The dorsal coat is grey, with a distinctive white patch on the rump which is surrounded by black hair. The underparts are white, with orange to reddish markings on the chin, cheeks and flanks. The tail is short, depressed, and almost hairless. Patagonian mara have feet that are compressed and hoof-like, contributing to its cursorial movement. There are 3 digits on the hindfeet and 4 on the forefeet (Ellerman, 1940). Due to its long hind limbs, they can run to speeds of 45 kilometres per hour (Rood, 1972 cited in Das Chagas et al., 2019) with some reaching speeds of 60 kilometres per hour (Parr, 2025). Unlike most other caviids, the anal glands are located between the anus and the base of the tail (BIS, 2025; Cabrera, 1953 cited in Campos et al., 2001a; Campos et al., 2001a; Ellerman, 1940; Kessler et al., 2009; Macdonald et al., 2007; Redford and Eisemberg, 1992; Vilalta, 2020). Patagonian mara “pronk” or “stott” as a form of defence against predators. They will jump upwards and forwards with all four legs off the ground. This behaviour is used as either an alarm (to warn other Patagonian mara of a predator) or a fitness signal (as a signal of strength and ability to escape or to attract a mate) (Das Chagas et al., 2019).

	General information: Distribution: Endemic to Argentina, from Bolson de Pipanaco, Catamarca Province at approximately 28 degrees south to 50 degrees south (Roach, 2016). Due to habitat alteration and hunting, the population has become locally extinct in the Buenos Aires Province and in the southwest of Córdoba, Argentina (Campos et al., 2001a; Rosacher, 2009 cited in Baechli et al., 2021). They are found at elevations below 1,000 metres (Mares and Ojeda, 1982a). There are 2 subspecies: ***D. p. centricola*** - occurs in the Catamarca Province, the eastern region of La Rioja Province, the northwest of Córdoba Province, and the southwest of Santiago del Estero Province (Cabrera, 1953 cited in Roach, 2016; Campos et al., 2001a; Roach, 2017). ***D. p. patagonum*** - occurs in the central area of Buenos Aires Province, the south of Cordoba Province, San Luis and Mendoza Provinces, and to the south of Argentina to Santa Cruz Province (Cabrera, 1953 cited in Roach, 2016; Campos et al., 2001a; Roach, 2017). Invasive populations in the United Arab Emirates (Dubai and Abu Dhabi; Saadiyat Island). It is suspected populations were formed due to released or escaped pets. The first reported appearance in the United Arab Emirates was in 2020, when a call for sightings was issued in the Dubai Natural History Group Newsletter *Gazelle* (Hellyer and Judas, 2020). Patagonian mara roam the grounds of Al Qudra Lakes, which is 55 kilometres from the centre of Dubai (MOCCAE, 2025), where they are often seen sleeping or eating grass (Judas, 2023). Judas (2023) has commented that although Patagonian maras prefer temperatures around 20 degrees Celsius, the absence of their usual predators may make their establishment in modified habitats (with tree plantations, lawns and ponds) more successful (Hellyer and Judas, 2020; Judas, 2023). Habitat: Adapted to survive in harsh environmental conditions characterised by unpredictable rainfall and extreme temperatures (Taber and MacDonald, 1992a). It prefers semi-arid open landscapes inhabiting open grasslands, brush, sandy-areas, herbaceous steppe, shrubland steppes and semi-arid areas (Baldi, 2007). In northwestern Argentina, they occur in lowland habitats, including forest and creosote bush (*Larrea*) flats (Campos et al., 2001a). Low strata open habitats are preferred as this allows for effective predator detection and easier ability to find a mate (Baldi, 2007; Rodríguez, 2009). Patagonian mara use a diverse range of habitats varying in both size and distance with some home range sizes up to 200 hectares (Macdonald et al., 2007). Rodríguez (2009) noted that in the Monte Desert, habitat varied

	from “large size areas (up to 30 hectares) separated by long distances (3,200 metres) to small patches (0.88 hectares) situated very close to one another (200 metres).” Patagonian maras are found in monogamous pairs with each couple having its own territory during the non-breeding period. These territories are also mobile. Therefore, there are often multiple micro-territories that overlap between pairs (Genest and Dubost, 1974; Macdonald et al., 2007; Taber and MacDonald, 1992a). During the dry season, once resources have been depleted, Patagonian maras will relocate and multiple pairs will congregate in resource rich areas (Kessler, 2009; Macdonald et al., 2007). Territories will also overlap for communal breeding (Taber, 1987). During the breeding season, they select warrens in either open or closed habitats. Baldi (2007) noted that on Peninsula Valdés, 58% of active warrens were observed in open grassland habitats, compared to 42% that were found in close habitats dominated by tall shrubs. Open warrens had more burrows and a higher reproductive success rate (Baldi, 2007). Although multiple pairs can inhabit the warrens, only 1 pair will breed in a burrow at one time (Baldi, 2007; Genest and Dubost, 1974). Males will not tolerate another male coming within 10 metres of his female. Bachelor males will often be seen closer together, particularly during resting, as the “10 metre rule” does not apply. Bachelor males will often lack aggressiveness and will be submissive to the dominant male in a pair (Genest and Dubost, 1974). Diet: Generalist and an opportunistic herbivore (Kufner et al., 1992 cited in Puig et al., 2010; Rodríguez and Daca, 2008; Kessler, 2009). They primarily consume grasses (such as *Poa* and *Stipa*) and dichotomous plants (like *Lycium* and *Prosopis* species) (Bonino et al., 1997; Campos et al., 2001b; Puig et al., 2010). Feeding constitutes a significant portion of their daily activities with females spending more time feeding than males, likely due to the demands of gestation and lactation (Taber, 1987). The Patagonian mara can be classified as both a browser and a grazer, depending on the season and the availability of food resources. As the regions become more arid and grass becomes depleted, it will adapt its diet and have a higher reliance on shrubs (Puig et al., 2010). Sombra and Mangione (2005) suggest that they may consume cacti as a source of water. Their feeding habits play a role in seed dispersal, particularly for *Prosopis flexuosa*, aiding in the regeneration of plant communities in their habitat (Campos and Ojeda, 1997). Reproduction: Viviparous (gives birth to live young). In southern Argentina, breeding is from August to January and these pairs often share communal dens, which can be occupied by up to 29 pairs (Baldi, 2007; Taber and

	Macdonald, 1992a). In Patagonia, most births occur between late August to October (Taber, 1987). Females are sexually mature by 8 months (Gatica et al., 2019; Mascow, 2011). In semi-captivity, reproduction is characterised by a highly unusual oestrous cycle, occurring once every 3 to 4 months and lasting only about half an hour (Genest and Dubost, 1974). In the wild, females typically produce 1 litter per year, however, more than 1 litter has been reported (Gatica et al., 2019). Gestation period varies between 91 to 111 days (Genest and Dubost, 1974; Gatica et al., 2019; Taber, 1987) and litters range from 1 to 3 pups (Gambrell, 2024) with an average of 2 pups (AnAge, 2023; Campos et al., 2001a). Females rear the young, and the male (who is always close to his female partner) will assist in protecting the young against external threats (Genest and Dubost, 1974). Pups are precocial, born fully furred with their eyes open and are weaned after 11 weeks (Kleiman, 1974 and Dubost and Genest, 1974 cited in Kessler, 2009; Taber, 1987). Adults will nurse their offspring outside the den and will often take turns watching the pups in "nurseries" as the other females go out to feed (BIS, 2025; Ganslosser and Wehnelt, 2009; Gatica et al., 2019). **Longevity:** The maximum recorded longevity for this species in captivity is 14.4 years (AnAge, 2023). The World Life Expectancy (2025) estimates the life span of the Patagonian mara is 14 years. **Conservation status:** **IUCN:** Near Threatened **CITES:** Not listed
DATE OF ORIGINAL ASSESSMENT: June 2025 (Aimee Carter) **Reviewers:** Jess Lyons and Veronica Blazely, DCCEEW **EIC Approval Date:** July 2026	**The risk assessment model:** Models for assessing the risk that exotic vertebrates could establish in Australia have been developed for mammals, birds (Bomford 2003, 2006, 2008), reptiles and amphibians (Bomford et al 2005, Bomford, 2006, 2008). Developed by Dr Mary Bomford for the Bureau of Rural Sciences (BRS), the model uses criteria that have been demonstrated to have significant correlation between a risk factor and the establishment of populations of exotic species and the pest potential of those species that do establish. For example, a risk factor for establishment is similarity in climate (temperature and rainfall) within the species' distribution overseas and Australia. For pest potential, the species' overseas pest status is a risk factor. The model is published as 'Risk assessment models for the establishment of exotic vertebrates in Australia and New Zealand' (Bomford 2008) and is available online on the PestSmart website https://pestsmart.org.au/wp-content/uploads/sites/3/2020/06/Risk_Assess_Models_2008_FINAL.pdf **CLIMATE**: In 2021 a new version of the Climatch program used to assess similarity in climate was released by the Australian Bureau of Agricultural Resource Economics and Sciences (ABARES): CLIMATCH v2.0. The increase in resolution in this new version (from 50 km to 20 km) required recalibration of Climate Match Scores. See Table 1.

Risk assessment model used for the assessment: Bomford 2008, Australian Bird and Mammal Model	Sixteen climate parameters (variables) of temperature and rainfall are used to estimate the extent of similarity between data from meteorological stations located within the species' world distribution and stations in Australia. Worldwide, data from approximately 19000 locations are available for analysis. The number of locations used in an analysis will vary according to the size of the species' distribution and the number of meteorological stations located within that distribution. To represent the climate match visually, the map of Australia is divided into 19236 grid squares, each measured in 0.2 degrees in both longitude and latitude. CLIMATCH v2.0 calculates a match for each Australian grid by comparing data from all meteorological stations within the species' distribution (excluding any populations in Australia) and allocating a score ranging from ten for the highest-level match to zero for the poorest match. Levels of climate match are used in the risk assessment for questions B1 (scores are summed to give a cumulative score), C6, and C8. Climatch v2.0 can be accessed on the ABARES website, agriculture.gov.au/abares. The direct URL is https://climatch.cp1.agriculture.gov.au/.

Australian Bird and Mammal Model:

FACTOR	SCORE	DETAIL
STAGE A: RISKS POSED BY CAPTIVE OR RELEASED ANIMALS		
A1. Risk to people from individual escapees (0–2) *Assess the risk that individuals of the species could harm people. (NB, this question only relates to aggressive behaviour shown by escaped or released individual animals. Question C11 addresses the risk of harm from aggressive behaviour if the species establishes a wild population).* *Aggressive behaviour, size, plus the possession of organs capable of inflicting harm, such as sharp teeth, claws, spines, a sharp bill, or toxin-delivering apparatus may enable individual animals to harm people. Any known history of the species attacking, injuring or killing people should also be taken into account. Assume the individual is not protecting nest or young.*	0	*All other animals posing a lower risk of harm to people (ie animals that will not make unprovoked attacks causing injury requiring medical attention, and which, even if cornered or handled, are unlikely to cause injury requiring hospitalisation).* The Patagonian mara is a relatively large, fast and flighty animal (Kessler, 2009) but they are not dangerous to people and unlikely to cause an injury that will require medical attention (Willard, 2024). However, they can be a vector of viruses, diseases and infections which can be transferred to both humans and livestock, such as leptospirosis, cowpox virus, *Toxoplasma gondii* and pulmonary besnoitiasis (Juan-Sallés et al., 2004; Kessler, 2009; Kik et al., 2006; Østevik et al., 2019; Wells et al., 2024). These pathogens can be transferred through cuts or bites.
A2. Risk to public safety from individual captive animals (0–2) *Assess the risk that irresponsible use of products obtained from captive individuals of the species (such as toxins) pose a public safety risk (excluding the safety of anyone entering the animals' cage/enclosure or otherwise coming within reach of the captive animals)*	0	*Nil or low risk (highly unlikely or not possible).*
STAGE A PUBLIC SAFETY RISK SCORE	0	**NOT dangerous**

SUM A1 - A2 (0-4)		
STAGE B: RISK OF ESTABLISHMENT **Probability escaped or released individuals will establish free-living populations**		
Model 1: FOUR-FACTOR MODEL FOR BIRDS AND MAMMALS (BOMFORD 2008)		
B1. Degree of climate match between species overseas range and Australia (1–6) *Map the selected mammal or bird species' overseas range, including its entire native and exotic (excluding Australia) ranges over the past 1000 years.* *Use CLIMATCH v2.0, Value X = sum of classes 6 – 10, see Table 1.*	3	*Moderate climate match to Australia* Value X = 5,825 Climate Match Score = 3 Endemic to Argentina (Roach, 2016). Península Valdés is not shown on the IUCN map, however Baldi (2007) reports an established population. Therefore, it has been included.
B2. Exotic population established overseas (0–4) *An established exotic population means the introduced species must have bred outside of captivity and must currently maintain a viable free-living population where the animals are not being intentionally fed or sheltered, even though they may be living in a highly disturbed environment with access to non-natural food supplies or shelter.*	4	*Exotic population established on a larger island (> 50 000 km^2) or anywhere on a continent (including elsewhere on the land mass where the natural distribution of the animal is, if this population is due to human introduction and is geographically separate from the natural range of the species).* Endemic to Argentina (Roach, 2016). Self-sustaining populations are established in Dubai and Abu Dhabi (Saadiyat Island) likely from released or escaped pets. Escaped and released individuals are reported on occasions from other countries such as Florida (USA) including Makinson Island (Figure 3) (EDDMaps, 2025; Invasive.org, 2025; Richards, 2025; Willard, 2024). However, these occurrences have not established self-sustaining populations and therefore have not been included on the risk assessment.
B3. Overseas range size score (0–2) < 1 = 0; 1– 70 = 1; >70 = 2 *Estimate the species overseas range size* including currently and the past 1000 years; natural and introduced range in millions of square kilometres*	1	*Overseas range between 1 to 70 million square kilometres.* Estimated overseas range of approximately 1.5 million km^2.
B4. Taxonomic Class (0–1) *Bird = 0; mammal = 1*	1	*Mammal*
B. ESTABLISHMENT RISK SCORE	9	**SERIOUS establishment risk**

SUM OF B1- B4 (1–13)		
Model 2: SEVEN-FACTOR MODEL FOR BIRDS AND MAMMALS (Bomford 2008)		
B5. Diet score (0–1) *Specialist = 0; generalist = 1*	1	*Generalist with a broad diet of many food types.* A generalist and an opportunistic herbivore (Kufner et al., 1992 cited in Puig et al., 2010; Rodríguez and Daca, 2008). Primarily consume grasses, such as *Poa* and *Stipa*, and dichotomous plants, such as *Lycium* and *Prosopis* species (Bonino et al., 1997; Puig et al., 2010).
B6. Habitat score (0–1) *Undisturbed or disturbed habitat*	1	*Can survive and breed in human-disturbed habitats (including grazing and agricultural lands, forests that are intensively managed or planted for timber harvesting and/or urban–suburban environments) without access to undisturbed (natural) habitats.* Often sighted on agricultural (cattle and sheep stations) and human modified lands. Rodríguez (2009) noted that in the La Pampa Province in Argentina, 94.4% of the areas where they were located were on human-modified habitats. In the United Arab Emirates, it has adapted to living in human modified habitats. Judas (2023) found although they prefer temperatures around 20 degrees Celsius, the absence of their usual predators may make their establishment in modified habitats with tree plantations, lawns and ponds more successful (Hellyer and Judas, 2020; Judas, 2023).
B7. Migratory score (0–1) *Always migratory = 0; non-migratory = 1*	1	*Non-migratory.*
B. ESTABLISHMENT RISK SCORE SUM OF B1- B7 (1–16)	12	**SERIOUS establishment risk**
STAGE C: RISK OF BECOMING A PEST **Probability an established species will become a pest**		
C1. Taxonomic group (0–4)	2	*Mammal in one of the orders that have been demonstrated to have detrimental effects on prey abundance and/or habitat degradation (Rodentia) = 2.*
C2. Overseas range size including current and past 1000 years, natural and introduced range (0–2)	0	*Overseas geographic range less than 10 million square kilometres.* Approximately 1.5 million km^2.

Estimate the species overseas range size (including current and past 1000 years, natural and introduced range) in millions of square kilometres		
C3. Diet and feeding (0–3)	3	*Mammal that is a primarily a grazer or browser.* A generalist and an opportunistic herbivore (Kufner et al., 1992 cited in Puig et al., 2010; Rodríguez and Daca, 2008; Kessler, 2009). Sombra and Mangione (2005) found that in Sierra de las Quijadas National Park (San Luis, Argentina), Patagonian maras consumed at least 24 different plant items of grasses and 22 items of shrubs plus forbs. A diverse range of vegetation was consumed including *Pappophorum* species, leaves of *Prosopis* species, fruit of *Prosopis torquate* and *Geoffroea decorticans* to name a few (Sombra and Mangione, 2005).
C4. Competition with native fauna for tree hollows (0–2)	0	*Does not use tree hollows.* Does not use tree hollows but instead uses burrows and warrens in open areas as breeding areas to protect their young against predators (Baldi, 2007).
C5. Overseas environmental pest status (0–3) *Has the species been reported to cause declines in abundance of any native species of plant or animal or cause degradation to any natural communities in any country or region of the world?*	1	*Minor environmental pest in any country or region.* Feeds on new herb growth and fruits (Kessler, 2009) which could have an impact on primary producers planting crops. They can reduce plant cover and the proportion of grasses in their habitat particularly during seasons of drought (Puig et al., 2018). Considered as an ecosystem engineer, they burrow to make warrens and dens for the protection of their offspring. These are only inhabited by the Patagonian mara during the breeding season, with other species (such as the Chaco tortoise (*Chelonoidis chilensis*)) utilising them as refuges or feeding sites at other times (Gatica et al., 2020).
C6. Climate match to areas with susceptible native species or communities (0–5) *Identify any native Australian animal or plant species or communities that could be susceptible to harm by the exotic species if it were to establish a wild population here.*	5	*The species has more than 691 grid squares within the highest two climate match classes that overlap the distribution of any susceptible native species or ecological communities = 5.* Examples of susceptible native species or ecological communities (DCCEEW Protected Matters Search Tool) include: *Dasyurus hallucatus* (Northern Quoll) – Endangered *Myrmecobius fasciatus* (Numbat) – Endangered *Onychogalea fraenata* (Bridled nailtail wallaby) – Endangered

		Duma horrida abdita (Remote Thorny Lignum) – Critically Endangered *Hibbertia abyssus* (Bandalup Buttercup) – Critically Endangered *Anomalopus mackayi* (Five-clawed work-skink) – Vulnerable Patagonian maras can compete with native species in competition for habitat space (Numbat; Five-clawed worm-skink), food resources (Bridled nailtail wallaby) and overgrazing (Remote Thorny Lignum; Bandalup Buttercup).
C7. Overseas primary production pest status (0–3) *Has the species been reported to damage crops or other primary production in any country or region of the world?*	1	*Minor pest of primary production in any country or region.* Prefer bare ground habitat which results in an increased presence of mara in grazed areas (Kufner and Chambouleyron, 2008). They often compete with sheep for similar grazing areas and found collocated on properties, particularly during the dry season (Macdonald et al., 2007). This may have an impact on resources available for herds. May have an impact on young crops as they eat new growth on herbs and fruits. Their feeding habits also play a role in seed dispersal, particularly for *Prosopis flexuosa*, aiding in the regeneration of plant communities in their habitat (Campos and Ojeda, 1997). This could result in the potential dispersal of invasive vegetation throughout Australia.
C8. Climate match to susceptible primary production (0–5) *Assess Potential Commodity Impact Scores for each primary production commodity listed in Table 9, based on species' attributes (diet, behaviour, ecology), excluding risk of spreading disease which is addressed in Question C9.* *0 = 0; 1-19 = 1; 20-49 = 2; 50-99 = 3; 100-149 = 4; ≥150 = 5*	5	Total Commodity Damage Score = 172.10 (see Table 2)
C9. Spread disease (1–2) *Assess the risk that the species could play a role in the spread of disease or parasites to other animals*	2	*All mammals (likely or unknown effect on native species and on livestock and other domestic animals).* Leptospirosis was reported in 3 individuals kept in captivity (Wells et al., 2024). Leptospirosis can spread in both domestic and wild animals. Humans can become infected through contact with water, food or soil of an infected animal as well as through cuts and abrasions. In rare circumstances, leptospirosis can cause death (NSW Health, 2021). Kik et al. (2006) reported confirmed cases of "generalized cow pox infections in Patagonian mara" at an educational park in the Netherlands. The authors noted that the likely

		transmission was from rats in the park. Although, there were no confirmed cases of transmission from the maras to humans, the authors did note the possibility of a public health risk if the virus was not recognised quickly (Kik et al., 2006). Other pathogens reported in captive mara include *Toxoplasma gondii* (Østevik et al., 2019), *Graphidioides affinis* which could possibly transmit from mara to human (Sutton and Dureette-Desset, 1995) and pulmonary besnoitiasis associated with interstitial pneumonia (Juan-Sallés et al., 2004). All species can play a role in the spread of diseases or parasites to other animals (native species and on livestock and other domestic animals) or to humans (zoonotic). For further information on the impacts of zoonotic diseases, the following links are available: Department of Agriculture, Fisheries and Forestry - Animal Import Risk Analysis Department of Agriculture, Fisheries and Forestry - Exotic Environmental Pest List Wildlife Health Australia - Fact Sheets
C10. Harm to property (0–3) *Assess the risk that the species could inflict damage on buildings, vehicles, fences, roads, equipment or ornamental gardens by chewing or burrowing or polluting with droppings or nesting material.*	1	*$1-$10 million.* No known adverse effects on humans (Mascow, 2011). However, as burrowers, they could cause problems to ornamental gardens.
C11. Harm to people (0–5) *Assess the risk that, if a wild population established, the species could cause harm to or annoy people. Aggressive behaviour, plus the possession of organs capable of inflicting harm, such as sharp teeth, tusks, claws, spines, a sharp bill, horns, antlers or toxin delivering organs may enable animals to harm people. Any known history of the species attacking, injuring or killing people should also be taken into account (see Stage A, Score A1).*	2	*Injuries, harm or annoyance likely to be minor and few people exposed: Low risk = 2.* Could become a reservoir or vector for endemic parasites or diseases that could be transmitted too and seriously affect people such as leptospirosis, cowpox virus, *Toxoplasma gondii* and pulmonary besnoitiasis (Juan-Sallés et al., 2004; Kessler, 2009; Kik et al., 2006; Østevik et al., 2019; Wells et al., 2024). Could be a social nuisance to farmers who have livestock such as sheep by reducing the availability of resources (Kufner and Chambouleyron, 2008; Macdonald et al., 2007).
C. PEST RISK SCORE SUM C 1 TO C 11 (1–37)	22	**EXTREME pest risk**
STAGE A. PUBLIC SAFETY RISK RANK – RISK TO PUBLIC SAFETY POSED BY CAPTIVE OR RELEASED INDIVIDUALS	0	NOT dangerous

0 = Not dangerous; 1 = Moderately dangerous; ≥ 2 = Highly dangerous		
STAGE B. ESTABLISHMENT RISK RANK – RISK OF ESTABLISHING A WILD POPULATION **MODEL 1: FOUR-FACTOR MODEL FOR BIRDS AND MAMMALS (BOMFORD 2008)** *≤ 5 = low establishment risk; 6-8 = moderate establishment risk; 9-10 = serious establishment risk; ≥ 11-13 = extreme establishment risk*	9	SERIOUS establishment risk
STAGE B. ESTABLISHMENT RISK RANK – RISK OF ESTABLISHING A WILD POPULATION **MODEL 2: SEVEN-FACTOR MODEL FOR BIRDS AND MAMMALS (BOMFORD 2008)** *≤ 6 = low establishment risk; 7-11 = moderate establishment risk; 12-13 = serious establishment risk; ≥14 = extreme establishment risk*	12	SERIOUS establishment risk
STAGE C. PEST RISK RANK - RISK OF BECOMING A PEST FOLLOWING ESTABLISHMENT *< 9 = low pest risk; 9-14 = moderate pest risk; 15-19 = serious pest risk; > 19 = extreme pest risk*	22	EXTREME pest risk

ENVIRONMENT AND INVASIVES COMMITTEE THREAT CATEGORY	**EXTREME**

World distribution map (IUCN Red List) and Climatch world distribution map indicating where meteorological data was sourced for the climate analysis (see B1):

Figure 1- World Distribution Map - IUCN Red List

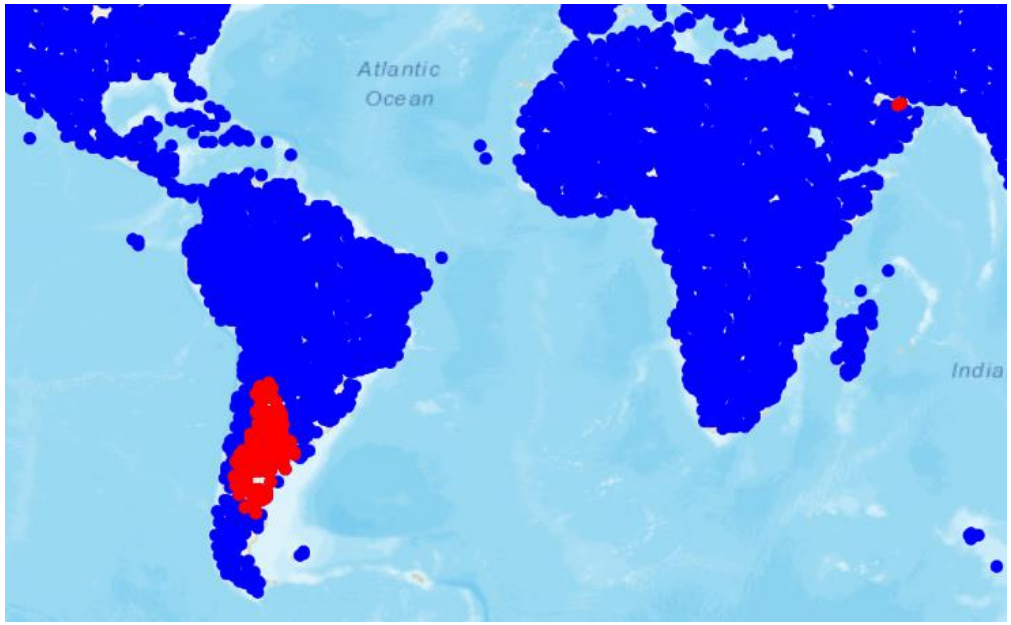

Figure 2 - World Distribution Map - Climatch

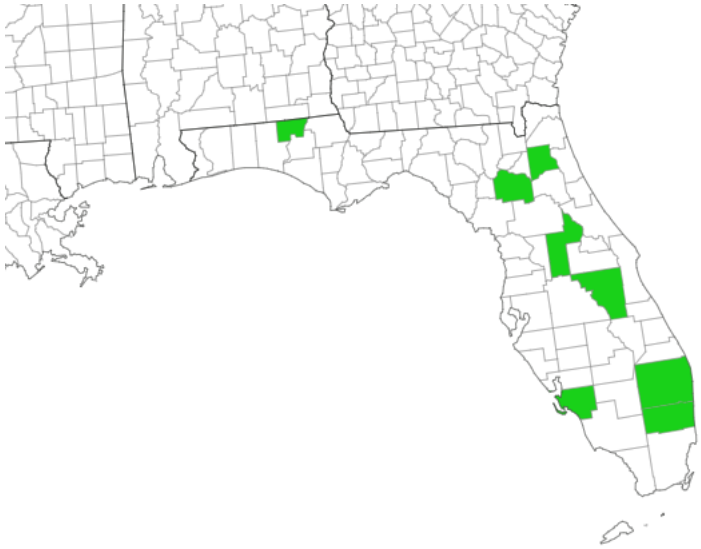

Figure 3 – EDDMaps – Florida reporting of Patagonian Mara

Figure 4 – Key for EDDMaps

Climate match between world distribution of species and Australia:

Areas of Australia where the climate appears suitable for *Dolichotis patagonum*

Value X = 5,825

Climate Match Score = 3 (Moderate)

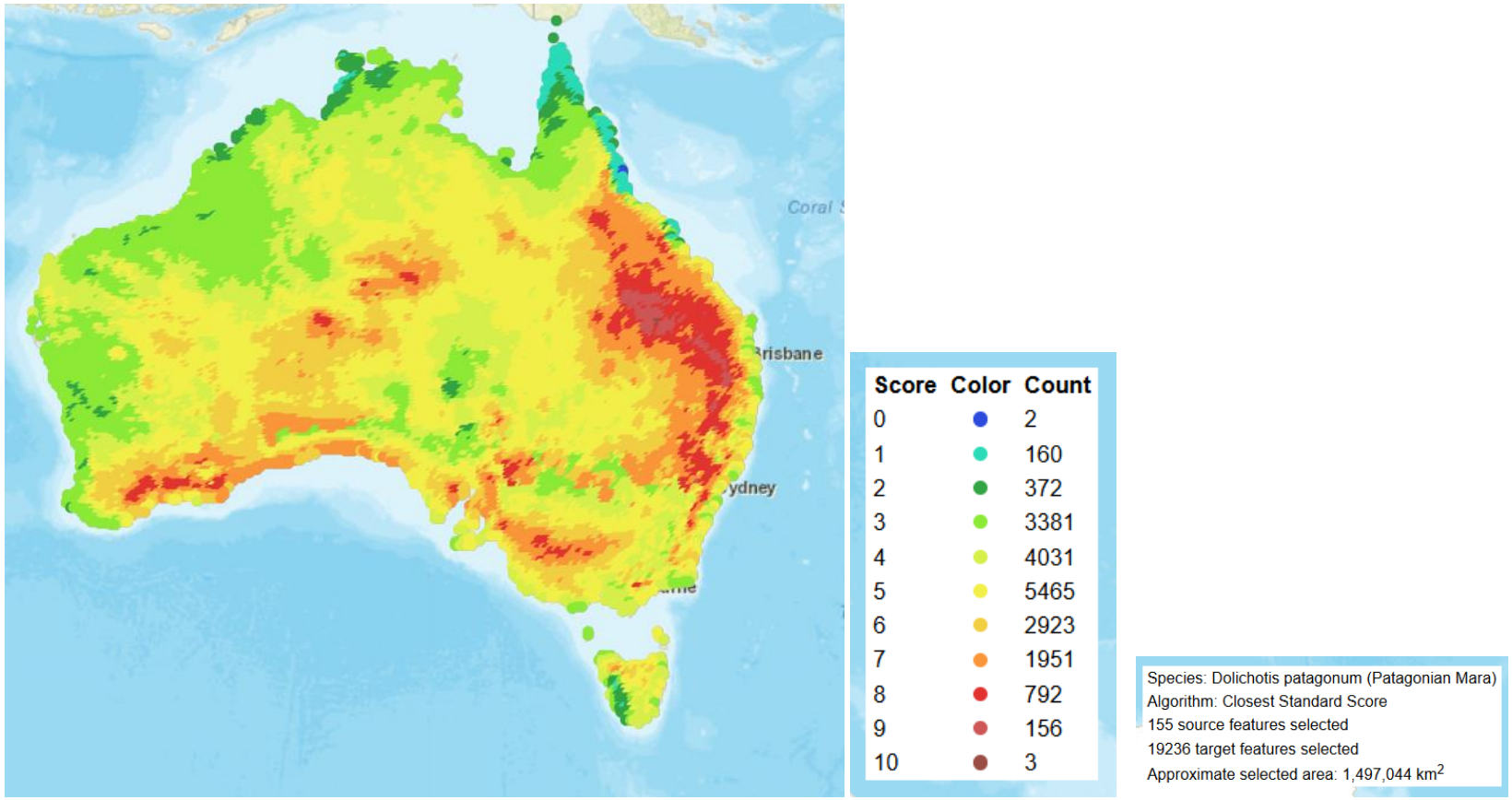

Table 1: ABARES recalibration thresholds

Climate Match Score (CMS)	Climatch (50 km) Closest Standard Match Sum Level 6 (Value X)	2021 Recalibrated Climatch v2.0 (20 km) Closest Standard Match Sum Level 6 (Value X)
1 (Very low)	< 100	< 691
2 (Low)	100-599	691-4137
3 (Moderate)	600-899	4138-6209
4 (High)	900-1699	6210-11735
5 (Very high)	1700-2699	11736-18642
6 (Extreme)	≥ 2700	≥ 18643

Table 2: Susceptible Australian Primary Production – Calculating Total Commodity Damage Score

The commodity value index scores in this table are derived from Australian Bureau of Statistics 2020 – 2021 data. The values will require updating if significant change has occurred in the value of the commodity (Bomford 2008).

Industry	**Commodity Value Index 1 (CVI based on best available date)**	**Potential Commodity Impact Score (PCIS 0-3)**	**Climate Match to Commodity Score (CMCS 0–5)**	**Commodity Damage Score (CDS columns 2 X 3 X 4)**
Cattle (includes dairy products and beef)	13	1	4	52
Forestry (includes hardwood and softwood)	2			
Cereal grain (includes wheat, barley, sorghum, corn, oats etc)	10	1	4	40
Sheep (includes wool and sheep meat)	5	1	3	15
Fruit and nuts (includes wine grapes)	5	1	4	20
Vegetables	3			
Poultry and eggs	3			
Fisheries products	2			
Oilseeds (includes canola, soybeans and sunflower etc)	2			
Grain legumes and pulses	1			
Sugarcane	1			
Cotton	1			
Other crops and horticulture (includes nurseries and flowers)	3	3	5	45
Pigs	1			
Other livestock (includes goats, deer, camels, rabbits)	0.1	1	1	0.1
Bees (includes honey and beeswax)	0.1			
Total Commodity Damage Score (TCDS)				172.10

Assess Potential Commodity Impact Scores for each primary production commodity listed in Table 9, based on species' attributes (diet, behaviour, ecology), excluding risk of spreading disease which is addressed in Question C9, and pest status worldwide as:

0. *Nil (species does not have attributes to make it capable of damaging this commodity)*
1. *Low (species has attributes making it capable of damaging this or similar commodities and has had the opportunity but no reports or other evidence that it has caused damage in any country or region*
2. *Moderate–serious (reports of damage to this or similar commodities exist but damage levels have never been high in any country or region and no major control programs against the species have ever been conducted OR the species has attributes making it capable of damaging this or similar commodities but has not had the opportunity)*
3. *Extreme (damage occurs at high levels to this or similar commodities and/or major control programs have been conducted against the species in any country or region and the listed commodity would be vulnerable to the type of harm this species can cause).*

Climate Match to Commodity Score (0–5)

- *None of the commodity is produced in areas where the species has a climate match within the highest eight climate match classes (i.e. classes 10, 9, 8, 7, 6, 5, 4 and 3) = 0*
- *Less than 10% of the commodity is produced in areas where the species has a climate match within the highest eight climate match classes = 1*
- *Less than 10% of the commodity is produced in areas where the species has a climate match within the highest six climate match classes (i.e. classes 10, 9, 8, 7, 6 and 5) = 2*
- *Less than 50% of the commodity is produced in areas where the species has a climate match within the highest six climate match classes AND less than 10% of the commodity is produced in areas where the species has a climate match within the highest three climate match classes (i.e. classes 10, 9 and 8) = 3*
- *Less than 50% of the commodity is produced in areas where the species has a climate match within the highest six climate match classes BUT more than 10% of the commodity is produced in areas where the species has a climate match within the highest three climate match classes = 4*
- *OR More than 50% of the commodity is produced in areas where the species has a climate match within the highest six climate match classes BUT less than 20% of the commodity is produced in areas where the species has a climate match within the highest three climate match classes = 4*
- *More than 20% of the commodity is produced in areas where the species has a climate match within the highest three climate match classes OR overseas range unknown and climate match to Australia unknown = 5.]*

Table 3: Assigning species to EIC Threat Categories (shaded cells relate to assignment of reptiles and amphibians to EIC Threat Categories based on an assessed establishment risk and an allocated pest risk of extreme) – adapted from Bomford 2008

Establishment Risk	Pest Risk	Public Safety Risk	EIC Threat Category	Implication for any proposed import into Australia	Implication for keeping and movement in Australia
Extreme	Extreme	Highly, Moderately or Not Dangerous	**EXTREME**	Prohibited, unless sufficient risk management measures exist to reduce the potential risks to an acceptable level	Limited to those collections approved for keeping particular EXTREME Threat species
Extreme	Serious	Highly, Moderately or Not Dangerous	**EXTREME**		
Extreme	Moderate	Highly, Moderately or Not Dangerous	**EXTREME**		
Extreme	Low	Highly, Moderately or Not Dangerous	**EXTREME**		
Serious	Extreme	Highly, Moderately or Not Dangerous	**EXTREME**		
Serious	Serious	Highly, Moderately or Not Dangerous	**EXTREME**		
Moderate	Extreme	Highly, Moderately or Not Dangerous	**EXTREME**		
Serious	Moderate	Highly, Moderately or Not Dangerous	**SERIOUS**	Import restricted to those collections approved for keeping SERIOUS Threat species	Limited to those collections approved for keeping particular SERIOUS Threat species
Serious	Low	Highly, Moderately or Not Dangerous	**SERIOUS**		
Moderate	Serious	Highly, Moderately or Not Dangerous	**SERIOUS**		
Moderate	Moderate	Highly Dangerous	**SERIOUS**		
Moderate	Low	Highly Dangerous	**SERIOUS**		
Low	Extreme	Highly, Moderately or Not Dangerous	**SERIOUS**		
Low	Serious	Highly, Moderately or Not Dangerous	**SERIOUS**		
Low	Moderate	Highly Dangerous	**SERIOUS**		
Low	Low	Highly Dangerous	**SERIOUS**		
Moderate	Moderate	Moderately or Not Dangerous	**MODERATE**	Import restricted to those collections approved for keeping MODERATE Threat species	Limited to those collections approved for keeping particular MODERATE Threat species
Moderate	Low	Moderately or Not Dangerous	**MODERATE**		
Low	Moderate	Moderately or Not Dangerous	**MODERATE**		
Low	Low	Moderately Dangerous	**MODERATE**		
Low	Low	Not Dangerous	**LOW**	Import permitted	May be limited to those collections approved for keeping particular LOW Threat species
Any Value	Any Value	Unknown	**EXTREME until proven otherwise**	Prohibited, unless sufficient risk management measures exist to reduce the potential risks to an acceptable level	Limited to those collections approved for keeping particular EXTREME Threat species
Unknown	Any Value	Any Value	**EXTREME until proven otherwise**		
Any Value	Unknown	Any Value	**EXTREME until proven otherwise**		
Unassessed	Unassessed	Unassessed	**EXTREME until proven otherwise**		

Bibliography:

ABARES (Australian Bureau of Agricultural and Resource Economics). (2025). Catchment scale land use of Australia and commodities – Update December 2023 - DAFF. Available at: https://www.agriculture.gov.au/abares/aclump/land-use/catchment-scale-land-use-and-commodities-update-2023 (Accessed: 11 June 2025).

Agriculture.gov.au. (2025). Climatch. Available at: https://climatch.cp1.agriculture.gov.au/ (Accessed: 11 June 2025).

AnAge. (2023). Patagonian mara (*Dolichotis patagonum*) longevity, ageing, and life history. Available at: https://genomics.senescence.info/species/entry.php?species=Dolichotis_patagonum (Accessed: 11 June 2025).

Baechli, J., Bellis, L.M., Capocasa, M.C.G. and Busso, J.M. (2021). Activity budget of zoo-housed Patagonian mara *Dolichotis patagonum* mates. *Journal of Zoo and Aquarium Research*, 9(1), pp. 14–19. Available at: https://doi.org/10.19227/jzar.v9i1.531

Baldi, R. (2007). Breeding success of the endemic mara *Dolichotis patagonum* in relation to habitat selection: Conservation implications. *Journal of Arid Environments*, 68(1), pp. 9–19. Available at: https://doi.org/10.1016/j.jaridenv.2006.03.025

BIS (Biodiversity Information System). (2025). *Dolichotis patagonum* (mara, liebre patagónica - Patagonian Cavy) | SIB, Parques Nacionales, Argentina. Sistema de Información de Biodiversidad. Available at: https://sib.gob.ar/especies/dolichotis-patagonum?tab=fuentes (Accessed: 16 June 2025).

Bomford, M. (2003). Risk Assessment for the Import and Keeping of Exotic Vertebrates in Australia. Bureau of Rural Sciences, Canberra.

Bomford, M. (2006). Risk assessment for the establishment of exotic vertebrates in Australia: recalibration and refinement of models - A report produced for the Department of Environment and Heritage. Bureau of Rural Sciences, Canberra.

Bomford, M. (2008). Risk assessment models for establishment of exotic vertebrates in Australia and New Zealand - A report produced for the Invasive Animals Cooperative Research Centre. Bureau of Rural Sciences, Canberra.

Bomford, M., Kraus, F., Braysher, M., Walter, L. and Brown, L. (2005). Risk Assessment Model for the Import and Keeping of Exotic Reptiles and Amphibians. A report produced for the Department of Environment and Heritage. Bureau of Rural Sciences, Canberra.

Bonino, N., Sbriller, A., Manacorda, M.M. and Larosa, F. (1997). Food partitioning between the mara (*Dolichotis patagonum*) and the introduced hare (*Lepus europaeus*) in the Monte Desert, Argentina. *Studies on Neotropical Fauna and Environment*, 32(3), pp. 129–134. Available at: https://doi.org/10.1080/01650521.1997.9709614

Braun, J.K. and Mares, M.A. (1995). The mammals of Argentina: an etymology. *Mastozoología Neotropical*, 2(2), pp. 173–206. Available at: https://vertebrados.wordpress.com/wp-content/uploads/2019/10/sarem_mastneotrop_2-2_05_braun_etymology.pdf (Accessed: 12 April 2025).

Cabrera, A. (1953). Los roedores argentinos de la familia Caviidae. Publicaciones de la Escuela Veterinaria, Universidad de Buenos Aires, 6, pp. 1–93.

Campos, C.M., Tognelli, M.F. and Ojeda, R.A. (2001a). *Dolichotis patagonum*. *Mammalian Species*, 652, pp. 1–5.

Campos, C., Ojeda, R., Monge, S. and Dacar, M. (2001b). Utilization of food resources by small and medium-sized mammals in the Monte Desert biome, Argentina. *Austral Ecology*, 26(2), pp. 142–149. Available at: https://doi.org/10.1046/j.1442-9993.2001.01098.x

Campos, C.M. and Ojeda, R. (1997). Dispersal and germination of *Prosopis flexuosa* (Fabaceae) seeds by desert mammals in Argentina. *Journal of Arid Environments*, 35(4), pp. 707–714. Available at:

https://www.academia.edu/1924414/Campos_C_y_R_Ojeda_1997_Dispersal_and_germination_of_Prosopis_flexuosa_Fabaceae_seeds_by_desert_mammals_in_Argentina_Journal_of_Arid_Environments_35_4_707_714 (Accessed: 13 June 2025).

Catalogue of Life. (2025). COL - *Dolichotis patagonum*. Available at: https://www.catalogueoflife.org/data/taxon/377CX (Accessed: 11 June 2025).

Chansiripornchai, P., Kesdangsakonwut, S. and Techangamsuwan, S. (2024). Anticoagulant rodenticide poisoning in farmed Patagonian mara (*Dolichotis patagonum*). *BMC Veterinary Research*, 20(1). Available at: https://doi.org/10.1186/s12917-024-03943-x

Chillo, V., Rodriguez, D. and Ojeda, R. (2010). Niche partitioning and coexistence between two mammalian herbivores in the Dry Chaco of Argentina. *Acta Oecologica*, 36(6), pp. 611–616.

CITES (Conservation on International Trade in Endangered Species). (2025). Checklist of CITES species: *Dolichotis patagonum*. Available at: https://checklist.cites.org/#/en/search/output_layout=alphabetical&level_of_listing=0&show_synonyms=1&show_author=1&show_english=1&show_spanish=1&show_french=1&scientific_name=Dolichotis+patagonum&page=1&per_page=20 (Accessed: 11 June 2025).

Clauss, M., Hagen, K.B., Frei, S., Ortmann, S., Lawrenz, A., Głogowski, R., Fritz, J., Flach, E. and Kreuzer, M. (2019). Digestive anatomy, physiology, resting metabolism and methane production of captive maras (*Dolichotis patagonum*). *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology*, 235, pp. 82–89. Available at: https://doi.org/10.1016/j.cbpa.2019.05.023

CMS (Convention on the Conservation of Migratory Species of Wild Animals). (2025). *Dolichotis patagonum*. Available at: https://www.cms.int/en/search?search=Dolichotis%20patagonum (Accessed: 11 June 2025).

Das Chagas, K.S.C., Vassallo, A.I., Becerra, F., Echeverría, A., de Castro Loguercio, M.F. and Rocha-Barbosa, O. (2019). Locomotion in the fastest rodent, the mara *Dolichotis patagonum* (Caviomorpha; Caviidae; Dolichotinae). *Mastozoología Neotropical*, 26(1), pp. 65–79. Available at: https://mn.sarem.org.ar/article/locomotion-in-the-fastest-rodent-the-mara-dolichotis-patagonum-caviomorpha-caviidae-dolichotinae/ (Accessed: 16 June 2025).

DCCEEW Protected Matters Search Tool (Department of Climate Change, Energy, the Environment and Water). (2025). Protected Matters Search Tool: Interactive Map. Available at: https://pmst.environment.gov.au/#/map?lng=131.52832031250003&lat=-28.6905876542507&zoom=5&baseLayers=Imagery (Accessed: 11 June 2025).

EDDMapS.org. (2025). Patagonian mara (*Dolichotis patagonum* (Zimmermann, 1780)) - EDDMapS. Available at: https://www.eddmaps.org/species/subject.cfm?sub=56292 (Accessed: 11 June 2025).

Ellerman, J.R. (1940). *The families and genera of living rodents*. British Museum (Natural History), London 1:181–698.

Gambrell, J. (2024). Argentine rodents are Dubai oasis' newest residents. AP News. Available at: https://apnews.com/article/dubai-patagonian-mara-uae-argentina-exotic-animals-c1a9460d8635a69d8f9a7e5a96e52ccf

Ganslosser, U. and Wehnelt, S. (1997). Juvenile development as part of extraordinary social system of the mara *Dolichotis patagonum* (Rodentia: Caviidae). *Mammalia*, 61(1), pp. 3–15. Available at: https://www.degruyterbrill.com/document/doi/10.1515/mamm.1997.61.1.3/html?srsltid=AfmBOor_lRq4wyygdX1QtR-MP-UwRh_ulw36Fk5wmUP3SkdcGfGpvcsD (Accessed: 12 April 2025).

Garcês, A., Rodrigues, P., Monteiro, C. and Pires, I. (2021). The unusual case of a renal urolith in a Mara (*Dolichotis patagonum*, Zimmermann 1780) in captivity. *Veterinarska stanica*, 52(4). Available at: https://doi.org/10.46419/vs.52.4.10

Gatica, A. and Mangione, A.M. (2019). Behavioural response of the mara (*Dolichotis patagonum*) to food density in Argentina. *Revista Mexicana de Mastozoología*, 1(2), pp. 40–47. Available at: https://doi.org/10.22201/ie.20074484e.2018.1.2.259

Gatica, A., Denkiewicz, N.M. and Ochoa, A.C. (2019). Breeding behavior of mara [*Dolichotis patagonum* (Zimmermann, 1780)] in the Monte-Chaco Ecotone of Argentina. *Mammal Study*, 44(4), pp. 1–9. Available at: https://doi.org/10.3106/ms2019-0006

Gatica, A., Ochoa, A.C., Dekiewicz, N.M. and Mangione, A.M. (2020). Wildlife associated with burrows of *Dolichotis patagonum* in central west Argentina. *Neotropical Biology and Conservation*, 15(3), pp. 399–407. Available at: https://doi.org/10.3897/neotropical.15.e54979

GBIF (Global Biodiversity Information Facility). (2025). *Dolichotis patagonum* (Zimmermann, 1780). Available at: https://www.gbif.org/species/2437619 (Accessed: 11 June 2025).

Genest, H. and Dubost, G. (1974). Pair living in the mara (*Dolichotis patagonum* Z.). *Mammalia*, 38, pp. 155–162.

GISD (Global Invasive Species Database). (2025). GISD. Available at: https://www.iucngisd.org/gisd/search.php (Accessed: 11 June 2025). No record.

Hellyer, P. and Judas, J. (2020). Sightings Requested. *Dubai Natural History Group Newsletter Gazelle*, 35(7 and 8), p. 7. Available at: https://www.dnhg.org/newsletter.html (Accessed: 12 April 2025).

Honacki, J.H., Kinman, K.E. and Koeppl, J.W. (1982). *Mammal species of the World: a taxonomic and geographic reference*. Allen Press and the Association of Systematics Collections. Lawrence, Kansas.

Invasive.org. (2025). Patagonian mara (*Dolichotis patagonum* (Zimmermann, 1780)). Available at: https://www.invasive.org/browse/subinfo.cfm?sub=56292 (Accessed: 16 June 2025).

ITIS (Integrated Taxonomic Information System). (2025). ITIS - Report: *Dolichotis patagonum*. Available at: https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=584722#null (Accessed: 11 June 2025).

Juan-Sallés, C., Rico, G., Garner, M.M. and Barr, B. (2004). Pulmonary besnoitiasis in Patagonian hare (*Dolichotis patagonum*) associated with interstitial pneumonia. *Veterinary Pathology*, 41, pp. 408–411. Available at: https://www.researchgate.net/publication/215873782_Pulmonary_besnoitiasis_in_patagonian_hare_Dolichotis_patagonum_associated_with_interstitial_pneumonia (Accessed: 12 April 2025).

Judas, J. (2023). Chapter 14: Terrestrial Mammals of the United Arab Emirates. In: Burt, J.A. (ed.) *A Natural History of the Emirates*. Springer Nature. Switzerland.

Kessler, D.S., Hope, K. and Maslanka, M. (2009). Behavior, Nutrition, and Veterinary Care of Patagonian Cavies (*Dolichotis patagonum*). *Veterinary Clinics of North America: Exotic Animal Practice*, 12(2), pp. 267–278. Available at: https://www.academia.edu/31625372/Behavior_nutrition_and_veterinary_care_of_patagonian_cavies_Dolichotis_patagonum_ (Accessed: 12 April 2025).

Kik, M., Liu, P.L. and van Asten, J.A.M. (2006). Cowpoxvirus infection in the Patagonian cavy (*Dolichotis patagonum*) emerging disease in an educational animal park the first reported case. *Veterinary Quarterly*, 28(2), pp. 42–44. Available at: https://doi.org/10.1080/01652176.2006.9695206.

Kufner, M.B. and Chambouleyron, M.B. (1991). Actividad espacial de *Dolichotis patagonum* en relacion a la estructura de la vegetacion en el Monte Argentino. *Studies on Neotropical Fauna and Environment*, 26(4), pp. 249–255. Available at: https://doi.org/10.1080/01650529109360860

Kufner, M.B. and Duranona, G. (1991). Consumo y eficiencia digestiva del mara, *Dolichotis patagonum* (Rodentia: Caviidae). *Ecologia Australia*, 1, pp. 50–55.

Kufner, M.B. (1995). Temporal activity of the mara (*Dolichotis patagonum*) in the Monte Desert, Argentina. *Studies on Neotropical Fauna and Environment*, 30, pp. 37–43.

Lacher, T.E. Jr. (2016). Family Caviidae. In: Wilson, D.E., Lacher, T.E. Jr and Mittermeier, R.A. (eds.) *Handbook of Mammals of the World*. Vol. 6. Lagomorphs and Rodents: Part 1. Lynx Editions, Barcelona.

Macdonald, D.W., Herrera, E.A., Taber, A.B. and Moreira, J.R. (2007). Social organization and resource use in capybaras and maras. In: Wolff, J.O. and Sherman, P.W. (eds.) *Rodent Societies: an ecological and evolutionary perspective*. University of Chicago Press. Chicago/London, pp. 393–402.

Mares, M.A. and Ojeda, R.A. (1982a). Patterns of diversity and adaptation in South American hystricognath rodents. In: Mares, M. and Genoways, H. (eds.) *Mammalian Biology in South America*. The University of Pittsburgh. Pennsylvania.

Mascow, M. (2011). *Dolichotis patagonum*. Animal Diversity Web. Available at: https://animaldiversity.org/accounts/Dolichotis_patagonum/ (Accessed: 11 June 2025).

MOCCAE (United Arab Emirates Ministry of Climate Change and Environment). (2025). Ecotourism | Knowledge | UAE Ministry of Climate Change and Environment. Available at: https://www.moccae.gov.ae/en/open-data/ecotourism/al-qudra-lakes (Accessed: 12 June 2025).

NSW (New South Wales) Health. (2018). Leptospirosis fact sheet - Fact sheets. Available at: https://www.health.nsw.gov.au/Infectious/factsheets/Pages/leptospirosis.aspx. (Accessed: 12 June 2025).

Ojeda, R.A. and Mares, M.A. (1982) Conservation of South American Mammals: Argentina as a paradigm. Available at: https://www.academia.edu/49996495/Conservation_of_South_American_Mammals_Argentina_as_a_paradigm. (Accessed: 13 June 2025).

Østevik, L., Tysnes, K.R., Klevar, S. and Debenham, J.J. (2019). *Toxoplasma gondii* infection in two captive Patagonian maras. *Journal of Veterinary Diagnostic Investigation* [online], 31(6), pp.875–878. Available online: https://doi.org/10.1177/1040638719883191

Parr, F. (2025). What's the world's fastest rodent? Discover the speed machine that can reach speeds of 37mph. Available at: https://www.discoverwildlife.com/animal-facts/mammals/fastest-rodent-patagonian-mara. (Accessed: 12 June 2025).

Periago, M.E., Chillo, V. and Ojeda, R.A. (2015). Loss of mammalian species from the South American Gran Chaco: empty savanna syndrome? *Mammal Review*, 45, pp. 41–53. Available at: https://doi.org/10.1111/mam.12031

Puig, S., Cona, M.I., Videla, F. and Mendez, E. (2010). Diet of the mara (*Dolichotis patagonum*), food availability and effects of an extended drought in Northern Patagonia (Mendoza, Argentina). *Mammalian Biology*, 75(5), pp. 389–398. Available at: https://doi.org/10.1016/j.mambio.2009.12.003.

Redford, K.H. and Eisenberg, J.F. (1992). *Mammals of the Neotropics: The Southern Cone*. University of Chicago Press, Chicago and London.

Richards, H. (2025). Argentinian Patagonian Mara rescued from Herts garden. Available at: https://www.thecomet.net/news/25141146.argentinian-patagonian-mara-rescued-redbourn-garden/. (Accessed: 16 June 2025).

Roach, N. (2016). IUCN Red List of Threatened Species: *Dolichotis patagonum*. Available at: https://www.iucnredlist.org/fr/species/6785/22190337. (Accessed: 11 June 2025).

Rodríguez, D. (2009). Modelling habitat use of the threatened and endemic mara (*Dolichotis patagonum*, Rodentia, Caviidae) in agricultural landscapes of Monte Desert. *Journal of Arid Environments*, 73(4–5), pp. 444–448. Available at: https://doi.org/10.1016/j.jaridenv.2008.12.010

Rodríguez, M. and Dacar, M. (2008). Diet composition of the mara (*Dolichotis patagonum*) in the southeast of the Monte desert of La Pampa province, Argentina. *Mastozoología Neotropical*, 15, pp. 215–220.

Rosenthal, M.A. (1974). Hand-rearing Patagonian cavies or maras: *Dolichotis patagonum*: at Lincoln Park, Chicago. *International Zoo Yearbook*, 14(1), pp. 214–215. Available at: https://doi.org/10.1111/j.1748-1090.1974.tb00825.x

SNZCBI (Smithsonian's National Zoo and Conservation Biology Institute). (2025). Patagonian mara. Available at: https://nationalzoo.si.edu/animals/patagonian-mara. (Accessed: 16 June 2025).

Sombra, M.S. and Mangione, A. (2005). Obsessed with grasses? The case of mara *Dolichotis patagonum* (Caviidae: Rodentia). *Revista Chilena de Historia Natural*, 78(3), pp. 95–105. Available at: https://www.researchgate.net/publication/289746098_Obsessed_with_grasses_The_case_of_mara_Dolichotis_patagonum_Caviidae_Rodentia. (Accessed: 13 June 2025).

Species+. (2025). Species+: *Dolichotis patagonum*. Available at: https://www.speciesplus.net/species#/taxon_concepts?taxonomy=cites_eu&taxon_concept_query=Dolichotis%20patagonum&geo_entities_ids=&geo_entity_scope=cites&page=1. (Accessed: 11 June 2025). No record.

Sutton, C.A. and Durette-Desset, M.-C. (1995). A description of *Graphidioides kravetzi* n. sp. and the revision of *Graphidioides* Cameron, 1923 (Nematoda Trichostrongyloidea), parasites of Neotropical rodents. *Systematic Parasitology*, 31(2), pp. 133–145. Available at: https://doi.org/10.1007/bf02185545

Taber, A.B. (1987). *The behavioural ecology of the mara Dolichotis patagonum*. Thesis, University of Oxford, United Kingdom.

Taber, A.B. and Macdonald, D.W. (1992a). Spatial organization and monogamy in the mara *Dolichotis patagonum*. *Journal of Zoology*, 227(3), pp. 417–438. Available at: https://doi.org/10.1111/j.1469-7998.1992.tb04404.x

Taber, A.B. and Macdonald, D.W. (1992b). Communal breeding in the mara, *Dolichotis patagonum*. *Journal of Zoology: Proceedings of the Zoological Society of London*, 227, pp. 439–452.

Verzi, D.H. and Quintana, C.A. (2005). The caviomorph rodents from the San Andrés Formation, east-central Argentina, and global Late Pliocene climatic change. *Palaeogeography*, 219(3–4), pp. 303–320. Available at: https://doi.org/10.1016/j.palaeo.2005.01.003

Vilalta, A.M. (2020). *Lynx illustrated checklist of the mammals of the Southern Cone: Argentina, Chile, Paraguay, Uruguay*. Lynx Edicions, Bellaterra, Barcelona.

Wells, T., Kiupel, M., Mani, R., Nofs, S.A., Thompson, K.A. and Eustace, R. (2024). Three cases of clinical leptospirosis in Patagonian maras (*Dolichotis patagonum*). *Journal of Zoo and Wildlife Medicine*, 55(2), pp. 502–510. Available at: https://doi.org/10.1638/2023-0042

Willard, H. (2024). Likely once a pet, a Patagonian mara is still on the loose in Lakewood. Available at: https://www.yahoo.com/news/likely-once-pet-patagonian-mara-012043362.html. (Accessed: 16 June 2025).

Woods, C.A. and Kilpatrick, C.W. (2005). Infraorder Hystricognathi. In: Wilson, D.E. and Reeder, D.M. (eds.) *Mammal Species of the World*. The Johns Hopkins University Press, Baltimore, MD, USA, pp. 1538–1599. Available at: https://www.departments.bucknell.edu/biology/resources/msw3/

World Life Expectancy. (2025). Patagonian cavy life expectancy. Available at: https://www.worldlifeexpectancy.com/mammal-life-expectancy-patagonian-cavy. (Accessed: 11 June 2025).