

= Great spotted kiwi =

The great spotted kiwi , great gray kiwi , or roroa ( *Apteryx haastii* ) is a species of kiwi endemic to the South Island of New Zealand . The great spotted kiwi , as a member of the ratites , is flightless . It is the largest of the kiwi . The rugged topography and harsh climate of the high altitude , alpine , part of its habitat render it inhospitable to a number of introduced mammalian predators , which include dogs , ferrets , cats and stoats . Because of this , populations of this species have been less seriously affected by the predations of these invasive species compared to other kiwi . Nonetheless , there has been a 43 % decline in population in the past 45 years , due to these predators and habitat destruction . This has led it to be classified as vulnerable . There are less than 16 @, @ 000 great spotted kiwis in total , almost all in the more mountainous parts of northwest Nelson , the northwest coast , and the Southern Alps . A minority live on island reserves .

This kiwi is highly aggressive , and pairs will defend their large territories ( 49 acres ) against other kiwi . Great spotted kiwi are nocturnal , and will sleep during the day in burrows . At night , they feed on invertebrates and will also eat plants . Great spotted kiwi breed between June and March . The egg is the largest of all birds in proportion to the size of the bird . Chicks take 75 to 85 days to hatch , and after hatching , they are abandoned by their parents .

= = Taxonomy and etymology = =

This large kiwi is one of five species of kiwis residing in New Zealand . The other four are the tokoeka ( *Apteryx australis* ) , Okarito brown kiwi ( *Apteryx rowi* ) , little spotted kiwi ( *Apteryx owenii* ) , and North Island brown kiwi ( *Apteryx mantelli* ) . Great spotted kiwis are related most closely to the little spotted kiwi . The kiwi genus , *Apteryx* , is endemic to New Zealand , 44 % of the bird species native to New Zealand are endemic . Kiwis are placed in the ratite family , which also includes the emu , ostrich , rhea , and cassowary . All ratites are flightless . Kiwi are closely related to the extinct moa bird that once inhabited New Zealand .

Relationships in the genus *Apteryx*

Before the great spotted kiwi was known to science , several stories circulated about the existence of a large kiwi called the Maori roaroa . In 1871 , two specimens were brought to the Canterbury Museum , where they were identified as a new species and were named after the museum 's curator , Dr. Haast .

The great spotted kiwi was first described as *Apteryx haastii* by Thomas Potts , in 1872 , based on a specimen from Westland , New Zealand . It is a monotypic species .

The genus name , *Apteryx* , comes from the Ancient Greek words a " without " or " no " , and pteryx , " wing " and haasti is the Latin form of the last name of Sir Julius von Haast .

= = Description = =

Great spotted kiwis are the largest of the kiwis ; the male is 45 cm ( 18 in ) tall , while the female is 50 cm ( 20 in ) tall . Bill length ranges from 9 to 12 cm ( 3 @. @ 5 ? 4 @. @ 7 in ) , while weight ranges between 1 @. @ 2 and 2 @. @ 6 kg ( 2 @. @ 6 and 5 @. @ 7 lb ) for males and 1 @. @ 5 and 3 @. @ 3 kg ( 3 @. @ 3 and 7 @. @ 3 lb ) for females . The body is pear @-@ shaped , while the head and neck is small with a long slender ivory bill . The great spotted kiwi , along with the other kiwi species , is the only bird with nostrils at the end of its bill . The eyes are small and do not see well , as it relies mostly on its sense of smell . The legs are short , with three toes per foot . It has a plumage composed of soft , hair @-@ like feathers , which have no aftershafts . The plumage can range from charcoal gray to light brown . They have large vibrissae around the gape , and they have no tail , only a small pygostyle . The common name of this bird comes from black spots on its feathers . They use their powerful legs and claws for defense against predators like stoats or ferrets . Kiwis are flightless birds , and hence lack hollow bones , lack a keel to which wing muscles anchor , and have tiny wings . This species also has a low body temperature compared to other birds . Average lifespan is 30 to 40 years .

## = = Distribution and habitat = =

Greater spotted kiwis once lived in numerous areas throughout the South Island , but because of predation by invasive species , the remaining kiwi are now restricted to three localities . These kiwi live in higher altitude areas . Populations are present from northwestern Nelson to the Buller River , the northwest coast ( Hurunui River to Arthur 's Pass ) , and the Paparoa Range , as well as within the Lake Rotoiti Mainland Island . The Southern Alps population is particularly isolated . Great spotted kiwis reside in complex , maze @-@ like burrows that they construct . Up to fifty burrows can exist in one bird 's territory . They will often move around , staying in a different burrow every day . Bird 's Nest Fungus sometimes grows in these burrows . Their habitat ranges in elevation from sea level to 1 @, @ 500 m ( 4 @, @ 900 ft ) , but the majority are concentrated in a range from 700 to 1 @, @ 100 m ( 2 @, @ 300 ? 3 @, @ 600 ft ) in a subalpine zone . These kiwis will live in tussock grasslands , scrubland , pasture , and forests .

## = = Conservation = =

The great spotted kiwi population started declining when European settlers first arrived in New Zealand . Before settlers arrived , about 12 million great spotted kiwis lived in New Zealand . This bird is often preyed upon by invasive pigs , dogs , ferrets and stoats , leading to a 5 % chick survival rate . It has more of an advantage than other kiwi species over these predators because it lives in high altitude areas , where the wet upland population thrives . However , there has been a decrease in population of 43 % in the past 45 years , and has declined 90 % since 1900 . Humans have also endangered the species by destroying their habitat by logging forests and building mines . Previously , humans hunted these kiwis for feathers and food . In 1988 , the species was listed as Least Concern species . It is currently classified by the IUCN as a vulnerable species . This kiwi has an occurrence range of 8 @, @ 500 km<sup>2</sup> ( 3 @, @ 300 sq mi ) , and in 2000 an estimated 22 @, @ 000 adult birds remained . They have been trending down about 5 @. @ 8 % a year . The main threat is from invasive predators including mustelids , brush @-@ tailed possum *Trichosurus vulpecula* , feral cats , dogs and pigs . The most threatened populations are in the southern areas of the species ' range . Less than 16 @, @ 000 great spotted kiwis remain . Movements for saving the kiwi are in place , and sanctuaries for the great spotted kiwi have been made . Thanks to intensive trapping and poisoning efforts the chick survival rate has been raised to about 60 % in areas where mammalian pest control is undertaken .

## = = Behaviour = =

The great spotted kiwi is nocturnal in behavior . If the kiwis live in an area lacking predators , they will come out in the day . At night , they come out to feed . Like other species of kiwi , they have a good sense of smell , which is unusual in birds . Males are fiercely territorial . At most , four to five kiwis live in a square kilometer . One pair 's territory can be 25 hectares ( 62 acres ) in size . It is not known how they defend such a large territory in proportion to their size . They will call , chase , or fight intruders out . Vocalisations of the great spotted kiwi include growls , hisses , and bill snapping . Great spotted kiwi males have a call that resembles a warbling whistle , while the female call is harsh raspy , and also warbling .

## = = Diet = =

In the ground , they dig for earthworms and grubs , and they search for beetles , cicada , crickets , flies , weta , spiders , caterpillars , slugs and snails on the ground . They will also feed on berries and seeds . To find prey , the great spotted kiwi use their scenting skills or feel vibrations caused by the movement of their prey . To do the latter , a kiwi would stick its beak into the ground , then use its beak to dig into the ground . As they are nocturnal , they do not emerge until thirty minutes after

sunset to begin the hunt . Kiwis will also swallow small stones , which aid in digestion .

#### = = = Predation = = =

Because adult great spotted kiwis are large and powerful , they are able to fend off most predators that attack them , such as stoats , ferrets , weasels , pigs , brush possums and cats , all of which are invasive species in New Zealand . However , dogs are able to kill even adults . Stoats , ferrets , possums , cats and dogs will feed on the eggs and chicks , meaning most chicks die within their first five months of life . Before the arrival of mammalian predators , the great spotted kiwi 's natural predators would have been birds of prey like the extinct Haast 's eagle and Eyles ' harrier and the extant Swamp harrier .

#### = = = Reproduction = = =

Great spotted kiwis are monogamous , with pairings sometimes lasting twenty years . Nests are made in burrows . The breeding season begins in June and ends in March , as this is when food is plentiful . Males reach sexual maturity at 18 months in captivity , while females are able to lay eggs after three years . In the wild , sexual maturity for both sexes is between ages three and five . Great spotted kiwi males chase females around until the females either run off or mate . The pair mates about two to three times during peak activity . The gestation period is about a month . Females do not eat during this period , as the eggs will take up a fourth of a kiwi 's body mass . The yolk takes up 65 % of the egg . In most bird eggs , the yolk takes up about 35 to 40 % of the egg . This makes the kiwi egg the largest in proportion to the body . Females must rely on fat stored from the previous five months to survive . Because of the large size of the egg , gestation is uncomfortable for the female , and they do not move much . To relieve the pain , females soak themselves in water when they come out of the burrows by dipping their abdomens into puddles . The egg @-@ laying season is between August and January .

After the female lays the egg , the male incubates the egg while the female guards the nest . Males only leave the nest for a few hours to hunt , and during this time , the female takes over . It takes 75 to 85 days for the egg to hatch . The kiwi chick takes 2 to 3 days simply to get out of its egg . Kiwi chicks are precocial , and are abandoned by their parents after hatching . After ten days , chicks venture out of the burrow to hunt . Most chicks are killed by predators in the first six months of their life . Great spotted kiwis reach full size at year six . Unlike most birds , female great spotted kiwis have two ovaries . Most birds have only one . Great spotted kiwis are distinguishable from other kiwi species by the fact that they can only produce one egg a year , as it takes so much energy to produce the massive egg .