

= Emu =

The emu (*Dromaius novaehollandiae*) is the second @-@ largest living bird by height , after its ratite relative , the ostrich . It is endemic to Australia where it is the largest native bird and the only extant member of the genus *Dromaius* . The emu 's range covers most of mainland Australia , but the Tasmanian emu and King Island emu subspecies became extinct after the European settlement of Australia in 1788 . The bird is sufficiently common for it to be rated as a least @-@ concern species by the International Union for Conservation of Nature .

Emus are soft @-@ feathered , brown , flightless birds with long necks and legs , and can reach up to 1 @. @ 9 metres (6 @. @ 2 ft) in height . Emus can travel great distances , and when necessary can sprint at 50 km / h (31 mph) ; they forage for a variety of plants and insects , but have been known to go for weeks without eating . They drink infrequently , but take in copious amounts of water when the opportunity arises .

Breeding takes place in May and June , and fighting among females for a mate is common . Females can mate several times and lay several clutches of eggs in one season . The male does the incubation ; during this process he hardly eats or drinks and loses a significant amount of weight . The eggs hatch after around eight weeks , and the young are nurtured by their fathers . They reach full size after around six months , but can remain as a family unit until the next breeding season . The emu is an important cultural icon of Australia , appearing on the coat of arms and various coins . The bird features prominently in Indigenous Australian mythology .

= = Taxonomy = =

= = = History = = =

Emus were first reported as having been seen by Europeans when explorers visited the western coast of Australia in 1696 ; this was an expedition led by Dutch captain Willem de Vlamingh who was searching for survivors of a ship that had gone missing two years earlier . The birds were known on the eastern coast before 1788 , when the first Europeans settled there . The birds were first mentioned under the name of the " New Holland cassowary " in Arthur Phillip 's *Voyage to Botany Bay* , published in 1789 with the following description :

This is a species differing in many particulars from that generally known , and is a much larger bird , standing higher on its legs and having the neck longer than in the common one . Total length seven feet two inches . The bill is not greatly different from that of the common Cassowary ; but the horny appendage , or helmet on top of the head , in this species is totally wanting : the whole of the head and neck is also covered with feathers , except the throat and fore part of the neck about half way , which are not so well feathered as the rest ; whereas in the common Cassowary the head and neck are bare and carunculated as in the turkey .

The plumage in general consists of a mixture of brown and grey , and the feathers are somewhat curled or bent at the ends in the natural state : the wings are so very short as to be totally useless for flight , and indeed , are scarcely to be distinguished from the rest of the plumage , were it not for their standing out a little . The long spines which are seen in the wings of the common sort , are in this not observable , ? nor is there any appearance of a tail . The legs are stout , formed much as in the Galeated Cassowary , with the addition of their being jagged or sawed the whole of their length at the back part .

The species was named by ornithologist John Latham in 1790 based on a specimen from the Sydney area of Australia , a country which was known as New Holland at the time . He collaborated on Phillip 's book and provided the first descriptions of , and names for , many Australian bird species ; *Dromaius* comes from a Greek word meaning " racer " and *novaehollandiae* is the Latin term for New Holland , so the name can be rendered as " fast @-@ footed New Hollander " . In his original 1816 description of the emu , the French ornithologist Louis Jean Pierre Vieillot used two generic names , first *Dromiceius* and later *Dromaius* . It has been a point of contention ever since as

to which name should be used ; the latter is more correctly formed , but the convention in taxonomy is that the first name given to an organism stands , unless it is clearly a typographical error . Most modern publications , including those of the Australian government , use *Dromaius* , with *Dromiceius* mentioned as an alternative spelling .

The etymology of the common name " emu " is uncertain , but is thought to have come from an Arabic word for large bird that was later used by Portuguese explorers to describe the related cassowary in Australia and New Guinea . Another theory is that it comes from the word " ema " , which is used in Portuguese to denote a large bird akin to an ostrich or crane . In Victoria , some terms for the emu were Barrimal in the Dja Dja Wurrung language , myoure in Gunai , and coun in Jardwadjali . The birds were known as murawung or birabayin to the local Eora and Darug inhabitants of the Sydney basin .

== Systematics ==

The emu was long classified , with its closest relatives the cassowaries , in the family *Casuariidae* , part of the ratite order *Struthioniformes* . However , an alternate classification was proposed in 2014 by Mitchell et al . , based on analysis of mitochondrial DNA . This splits off the *Casuariidae* into their own order , the *Casuariformes* , and includes only the cassowaries in the family *Casuariidae* , placing the emus in their own family , *Dromaiidae* . The cladogram shown below is from their study .

Two different *Dromaius* species were present in Australia at the time of European settlement , and one additional species is known from fossil remains . The insular dwarf emus , *D. baudinianus* and *D. n. minor* , originally present on Kangaroo Island and King Island respectively , both became extinct shortly after the arrival of Europeans . *D. n. diemenensis* , a subspecies known as the Tasmanian emu , became extinct around 1865 . However , the mainland sub-@ species , *D. n. novaehollandiae* , remains common . The population of these birds varies from decade to decade , largely being dependent on rainfall ; in 2009 , it was estimated that there were between 630 @, @ 000 and 725 @, @ 000 birds . Emus were introduced to Maria Island off Tasmania , and Kangaroo Island off the coast of South Australia , during the 20th century . While the Maria Island population died out in the mid @-@ 1990s , more birds have since been introduced , and attempts are being made to breed a form similar to the Tasmanian emu . The Kangaroo Island birds have successfully established a breeding population .

In 1912 , the Australian ornithologist Gregory M. Mathews recognised three living subspecies of emu , *D. n. novaehollandiae* (Latham , 1790) , *D. n. woodwardi* Mathews , 1912 and *D. n. rothschildi* Mathews , 1912 . However , the Handbook of the Birds of the World argues that the last two of these subspecies are invalid ; natural variations in plumage colour and the nomadic nature of the species make it likely that there is a single race in mainland Australia . Examination of the DNA of the King Island emu shows this bird to be closely related to the mainland emu and hence best treated as a subspecies .

== Description ==

The emu is the second largest bird in the world , only being exceeded in size by the ostrich ; the largest individuals can reach up to 150 to 190 cm (59 to 75 in) in height . Measured from the bill to the tail , emus range in length from 139 to 164 cm (55 to 65 in) , with males averaging 148 @. @ 5 cm (58 @. @ 5 in) and females averaging 156 @. @ 8 cm (61 @. @ 7 in) . Emus weigh between 18 and 60 kg (40 and 132 lb) , with an average of 31 @. @ 5 and 37 kg (69 and 82 lb) in males and females , respectively . Females are usually slightly larger than males and are substantially wider across the rump .

Although flightless , emus have vestigial wings , the wing chord measuring around 20 cm (8 in) , and each wing having a small claw at the tip . Emus flap their wings when running , perhaps as a means of stabilising themselves when moving fast . They have long necks and legs , and can run at speeds of 48 km / h (30 mph) due to their highly specialised pelvic limb musculature . Their feet have only three toes and a similarly reduced number of bones and associated foot muscles ; emus

are the only birds with gastrocnemius muscles in the back of the lower legs . The pelvic limb muscles of emus contribute a similar proportion of the total body mass as do the flight muscles of flying birds . When walking , the emu takes strides of about 100 cm (3 @. @ 3 ft) , but at full gallop , a stride can be as long as 275 cm (9 ft) . Its legs are devoid of feathers and underneath its feet are thick , cushioned pads . Like the cassowary , the emu has sharp claws on its toes which are its major defensive attribute , and are used in combat to inflict wounds on opponents by kicking . The toe and claw total 15 cm (6 in) in length . The bill is quite small , measuring 5 @. @ 6 to 6 @. @ 7 cm (2 @. @ 2 to 2 @. @ 6 in) , and is soft , being adapted for grazing . Emus have good eyesight and hearing , which allows them to detect threats at some distance .

The neck of the emu is pale blue and shows through its sparse feathers . They have grey @-@ brown plumage of shaggy appearance ; the shafts and the tips of the feathers are black . Solar radiation is absorbed by the tips , and the inner plumage insulates the skin . This prevents the birds from overheating , allowing them to be active during the heat of the day . A unique feature of the emu feather is the double rachis emerging from a single shaft . Both of the rachis have the same length , and the texture is variable ; the area near the skin is rather furry , but the more distant ends resemble grass . The sexes are similar in appearance , although the male 's penis can become visible when he urinates and defecates . The plumage varies in colour due to environmental factors , giving the bird a natural camouflage . Feathers of emus in more arid areas with red soils have a rufous tint while birds residing in damp conditions are generally darker in hue . The juvenile plumage develops at about three months and is blackish finely barred with brown , with the head and neck being especially dark . The facial feathers gradually thin to expose the bluish skin . The adult plumage has developed by about fifteen months .

The eyes of an emu are protected by nictitating membranes . These are translucent , secondary eyelids that move horizontally from the inside edge of the eye to the outside edge . They function as visors to protect the eyes from the dust that is prevalent in windy arid regions . Emus have a tracheal pouch , which becomes more prominent during the mating season . At more than 30 cm (12 in) in length , it is quite spacious ; it has a thin wall , and an opening just 8 centimetres (3 in) long .

= = Distribution and habitat = =

Once common on the east coast of Australia , emus are now uncommon there ; by contrast , the development of agriculture and the provision of water for stock in the interior of the continent have increased the range of the emu in arid regions . Emus live in various habitats across Australia both inland and near the coast . They are most common in areas of sclerophyll forest and savannah woodland , and least common in heavily populated districts and arid areas with annual precipitation of less than 600 millimetres (24 in) . Emus predominately travel in pairs , and while they can form large flocks , this is an atypical social behaviour that arises from the common need to move towards a new food source . Emus have been shown to travel long distances to reach abundant feeding areas . In Western Australia , emu movements follow a distinct seasonal pattern ? north in summer and south in winter . On the east coast their wanderings seem to be more random and do not appear to follow a set pattern .

= = Behaviour and ecology = =

Emus are diurnal birds and spend their day foraging , preening their plumage with their beak , dust bathing and resting . They are generally gregarious birds apart from the breeding season , and while some forage , others remain vigilant to their mutual benefit . They are able to swim when necessary , although they rarely do so unless the area is flooded or they need to cross a river .

Emus begin to settle down at sunset and sleep during the night . They do not sleep continuously but rouse themselves several times during the night . When falling asleep , emus first squat on their tarsi and enter a drowsy state during which they are alert enough to react to stimuli and quickly return to a fully awakened state if disturbed . As they fall into deeper sleep , their neck droops closer

to the body and the eyelids begin to close . If there are no disturbances , they fall into a deeper sleep after about twenty minutes . During this phase , the body is gradually lowered until it is touching the ground with the legs folded underneath . The beak is turned down so that the whole neck becomes S @-@ shaped and folded onto itself . The feathers direct any rain downwards onto the ground . It has been suggested that the sleeping position is a type of camouflage , mimicking a small mound . Emus typically awake from deep sleep once every ninety minutes or so and stand upright to feed briefly or defecate . This period of wakefulness lasts for ten to twenty minutes , after which they return to slumber . Overall , an emu sleeps for around seven hours in each twenty @-@ four @-@ hour period . Young emus usually sleep with their neck flat and stretched forward along the ground surface .

The vocalisations of emus mostly consist of various booming and grunting sounds . The booming is created by the inflatable throat pouch ; the pitch can be regulated by the bird and depends on the size of the aperture . Most of the booming is done by females ; it is part of the courtship ritual , is used to announce the holding of territory and is issued as a threat to rivals . A high @-@ intensity boom is audible 2 kilometres (1 @.@ 2 mi) away , while a low , more resonant call , produced during the breeding season , may at first attract mates and peaks while the male is incubating the eggs . Most of the grunting is done by males . It is used principally during the breeding season in territorial defence , as a threat to other males , during courtship and while the female is laying . Both sexes sometimes boom or grunt during threat displays or on encountering strange objects .

On very hot days , emus pant to maintain their body temperature , their lungs work as evaporative coolers and , unlike some other species , the resulting low levels of carbon dioxide in the blood do not appear to cause alkalosis . For normal breathing in cooler weather , they have large , multifolded nasal passages . Cool air warms as it passes through into the lungs , extracting heat from the nasal region . On exhalation , the emu 's cold nasal turbinates condense moisture back out of the air and absorb it for reuse . As with other ratites , the emu has great homeothermic ability , and can maintain this status from ? 5 to 45 ° C (23 to 113 ° F) . The thermoneutral zone of emus lies between 10 and 30 ° C (50 and 86 ° F) .

As with other ratites , emus have a relatively low basal metabolic rate compared to other types of birds . At ? 5 ° C (23 ° F) , the metabolic rate of an emu sitting down is about 60 % of that when standing , partly because the lack of feathers under the stomach leads to a higher rate of heat loss when standing from the exposed underbelly .

== = Diet == =

Emus forage in a diurnal pattern and eat a variety of native and introduced plant species . The diet depends on seasonal availability with such plants as Acacia , Casuarina and grasses being favoured . They also eat insects and other arthropods , including grasshoppers and crickets , beetles , cockroaches , ladybirds , Bogong and cotton @-@ boll moth larvae , ants , spiders and millipedes . This provides a large part of their protein requirements . In Western Australia , food preferences have been observed in travelling emus ; they eat seeds from Acacia aneura until the rains arrive , after which they move on to fresh grass shoots and caterpillars ; in winter they feed on the leaves and pods of Cassia and in spring , they consume grasshoppers and the fruit of Santalum acuminatum , a sort of quandong . They are also known to feed on wheat , and any fruit or other crops that they can access , easily climbing over high fences if necessary . Emus serve as an important agent for the dispersal of large viable seeds , which contributes to floral biodiversity . One undesirable effect of this occurred in Queensland in the early twentieth century when emus fed on the fruit of prickly pears in the outback . They defecated the seeds in various places as they moved around , and this led to a series of campaigns to hunt emus and prevent the seeds of the invasive cactus being spread . The cacti were eventually controlled by an introduced moth (Cactoblastis cactorum) whose larvae fed on the plant , one of the earliest examples of biological control .

Small stones are swallowed to assist in the grinding up and digestion of the plant material . Individual stones may weigh 45 g (1 @.@ 6 oz) and the birds may have as much as 745 g (1 @.@ 642 lb) in their gizzards at one time . They also eat charcoal , although the reason for this is

unclear . Captive emus have been known to eat shards of glass , marbles , car keys , jewellery , and nuts and bolts .

Emus drink infrequently , but ingest large amounts when the opportunity arises . They typically drink once a day , first inspecting the water body and surrounding area in groups before kneeling down at the edge to drink . They prefer being on firm ground while drinking , rather than on rocks or mud , but if they sense danger , they often stand rather than kneel . If not disturbed , they may drink continuously for ten minutes . Due to the scarcity of water sources , emus are sometimes forced to go without water for several days . In the wild , they often share water holes with kangaroos , other birds and animals ; they are wary and tend to wait for the other animals to leave before they quench their thirst .

= = = Breeding = = =

Emus form breeding pairs during the summer months of December and January , and may remain together for about five months . During this time , they stay in an area a few kilometres in diameter and it is believed they find and defend territory within this area . Both males and females put on weight during the breeding season , with the female becoming slightly heavier at between 45 and 58 kg (99 and 128 lb) . Mating usually takes place between April and June ; the exact timing is determined by the climate as the birds nest during the coolest part of the year . During the breeding season , males experience hormonal changes , including an increase in luteinizing hormone and testosterone levels , and their testicles double in size .

Males construct a rough nest in a semi @-@ sheltered hollow on the ground , using bark , grass , sticks and leaves to line it . The nest is almost always a flat surface rather than a segment of a sphere , although in cold conditions the nest is taller , up to 7 cm (2 @. @ 8 in) tall , and more spherical to provide some extra heat retention . When other material is lacking , the bird sometimes uses a spinifex tussock a metre or so across , despite the prickly nature of the foliage . The nest can be placed on open ground or near a shrub or rock . The nest is usually placed in an area where the emu has a clear view of its surroundings and can detect approaching predators .

Female emus court the males ; the female 's plumage darkens slightly and the small patches of bare , featherless skin just below the eyes and near the beak turn turquoise @-@ blue . The colour of the male 's plumage remains unchanged , although the bare patches of skin also turn light blue . When courting , females stride around , pulling their neck back while puffing out their feathers and emitting low , monosyllabic calls that have been compared to drum beats . This calling can occur when males are out of sight or more than 50 metres (160 ft) away . Once the male 's attention has been gained , the female circles her prospective mate at a distance of 10 to 40 metres (30 to 130 ft) . As she does this , she looks at him by turning her neck , while at the same time keeping her rump facing towards him . If the male shows interest in the parading female , he will move closer ; the female continues the courtship by shuffling further away but continuing to circle him .

If a male is interested , he will stretch his neck and erect his feathers , then bend over and peck at the ground . He will circle around and sidle up to the female , swaying his body and neck from side to side , and rubbing his breast against his partner 's rump . Often the female will reject his advances with aggression , but if amenable , she signals acceptance by squatting down and raising her rump .

Females are more aggressive than males during the courtship period , often fighting for access to mates , with fights among females accounting for more than half the aggressive interactions during this period . If females court a male that already has a partner , the incumbent female will try to repel the competitor , usually by chasing and kicking . These interactions can be prolonged , lasting up to five hours , especially when the male being fought over is single and neither female has the advantage of incumbency . In these cases , the females typically intensify their calls and displays .

The sperm from a mating is stored by the female and can suffice to fertilise about six eggs . The pair mate every day or two , and every second or third day the female lays one of a clutch of five to fifteen very large , thick @-@ shelled , green eggs . The shell is around 1 mm (0 @. @ 04 in) thick , but rather thinner in northern regions according to indigenous Australians . The eggs are on average

13 cm × 9 cm (5 @. @ 1 in × 3 @. @ 5 in) and weigh between 450 and 650 g (1 @. @ 0 and 1 @. @ 4 lb) . The maternal investment in the egg is considerable , and the proportion of yolk to albumen , at about 50 % , is greater than would be predicted for a precocial egg of this size . This probably relates to the long incubation period which means the developing chick must consume greater resources before hatching . The first verified occurrence of genetically identical avian twins was demonstrated in the emu . The egg surface is granulated and pale green . During the incubation period , the egg turns dark green , although if the egg never hatches , it will turn white from the bleaching effect of the sun .

The male becomes broody after his mate starts laying , and may begin to incubate the eggs before the clutch is complete . From this time on , he does not eat , drink , or defecate , and stands only to turn the eggs , which he does about ten times a day . He develops a brood patch , a bare area of wrinkled skin which is in intimate contact with the eggs . Over the course of the eight @-@ week incubation period , he will lose a third of his weight and will survive on stored body fat and on any morning dew that he can reach from the nest . As with many other Australian birds , such as the superb fairywren , infidelity is the norm for emus , despite the initial pair bond : once the male starts brooding , the female usually wanders off , and may mate with other males and lay in multiple nests ; thus , as many as half the chicks in a brood may not be fathered by the incubating male , or even by either parent , as emus also exhibit brood parasitism .

Some females stay and defend the nest until the chicks start hatching , but most leave the nesting area completely to nest again ; in a good season , a female emu may nest three times . If the parents stay together during the incubation period , they will take turns standing guard over the eggs while the other drinks and feeds within earshot . If it perceives a threat during this period , it will lie down on top of the nest and try to blend in with the similar @-@ looking surrounds , and suddenly stand up to confront and scare the other party if it comes close .

Incubation takes 56 days , and the male stops incubating the eggs shortly before they hatch . The temperature of the nest rises slightly during the eight @-@ week period . Although the eggs are laid sequentially , they tend to hatch within two days of one another , as the eggs that were laid later experienced higher temperatures and developed more rapidly . During the process , the precocial emu chicks need to develop a capacity for thermoregulation . During incubation , the embryos are kept at a constant temperature but the chicks will need to be able to cope with varying external temperatures by the time they hatch .

Newly hatched chicks are active and can leave the nest within a few days of hatching . They stand about 12 cm (5 in) tall at first , weigh 0 @. @ 5 kg (17 @. @ 6 oz) , and have distinctive brown and cream stripes for camouflage , which fade after three months or so . The male guards the growing chicks for up to seven months , teaching them how to find food . Chicks grow very quickly and are fully grown in five to six months ; they may remain with their family group for another six months or so before they split up to breed in their second season . During their early life , the young emus are defended by their father , who adopts a belligerent stance towards other emus , including the mother . He does this by ruffling his feathers , emitting sharp grunts , and kicking his legs to drive off other animals . He can also bend his knees to crouch over smaller chicks to protect them . At night , he envelops his young with his feathers . As the young emus cannot travel far , the parents must choose an area with plentiful food in which to breed . In captivity , emus can live for upwards of ten years .

== = Predation == =

There are few native natural predators of emus still alive . Early in its species history it may have faced numerous terrestrial predators now extinct , including the giant lizard *Megalania* , the thylacine , and possibly other carnivorous marsupials , which may explain their seemingly well @-@ developed ability to defend themselves from terrestrial predators . The main predator of emus today is the dingo , which was originally introduced by Aboriginals thousands of years ago from a stock of semi @-@ domesticated wolves . Dingoes try to kill the emu by attacking the head . The emu typically tries to repel the dingo by jumping into the air and kicking or stamping the dingo on its way

down . The emu jumps as the dingo barely has the capacity to jump high enough to threaten its neck , so a correctly timed leap to coincide with the dingo 's lunge can keep its head and neck out of danger .

Despite the potential prey @-@ predator relationship , the presence of predaceous dingoes does not appear to heavily influence emu numbers , with other natural conditions just as likely to cause mortality . Wedge @-@ tailed eagles are the only avian predator capable of attacking fully @-@ grown emus , though are perhaps most likely to take small or young specimens . The eagles attack emus by swooping downwards rapidly and at high speed and aiming for the head and neck . In this case , the emu 's jumping technique as employed against the dingo is not useful . The birds try to target the emu in open ground so that it cannot hide behind obstacles . Under such circumstances , the emu can only run in a chaotic manner and change directions frequently to try and evade its attacker . Other raptors , monitor lizards , introduced red foxes , feral and domestic dogs , and feral pigs occasionally feed on emu eggs or kill small chicks .

= = = Parasites = = =

Emus can suffer from both external and internal parasites , but under farmed conditions are more parasite @-@ free than ostriches or rheas . External parasites include the louse *Dahlehornia asymmetrica* and various other lice , ticks , mites and flies . Chicks sometimes suffer from intestinal tract infections caused by coccidian protozoa , and the nematode *Trichostrongylus tenuis* infects the emu as well as a wide range of other birds , causing haemorrhagic diarrhoea . Other nematodes are found in the trachea and bronchi ; *Syngamus trachea* causing haemorrhagic tracheitis and *Cyathostoma variegatum* causing serious respiratory problems in juveniles .

= = Relationship with humans = =

Emus were used as a source of food by indigenous Australians and early European settlers . Emus are inquisitive birds and have been known to approach humans if they see unexpected movement of a limb or piece of clothing . In the wild , they may follow and observe people . Aboriginal Australians used a variety of techniques to catch the birds , including spearing them while they drank at waterholes , catching them in nets , and attracting them by imitating their calls or by arousing their curiosity with a ball of feathers and rags dangled from a tree . The pitchuri thornapple (*Duboisia hopwoodii*) , or some similar poisonous plant , could be used to contaminate a waterhole , after which the disoriented emus were easy to catch . Another stratagem was for the hunter to use a skin as a disguise , and the birds could be lured into a camouflaged pit trap using rags or imitation calls . Aboriginal Australians only killed emus out of necessity , and frowned on anyone who hunted them for any other reason . Every part of the carcass had some use ; the fat was harvested for its valuable , multiple @-@ use oil , the bones were shaped into knives and tools , the feathers were used for body adornment and the tendons substituted for string .

The early European settlers killed emus to provide food and used their fat for fuelling lamps . They also tried to prevent them from interfering with farming or invading settlements in search of water during drought . An extreme example of this was the Emu War in Western Australia in 1932 . Emus flocked to the Chandler and Walgoolan area during a dry spell , damaging rabbit fencing and devastating crops . An attempt to drive them off was mounted , with the army called in to dispatch them with machine guns ; the emus largely avoided the hunters and won the battle . Emus are large , powerful birds , and their legs are among the strongest of any animal and powerful enough to tear down metal fencing . The birds are very defensive of their young , and there have been two documented cases of humans being attacked by emus .

= = = Economic value = = =

In the areas in which it was endemic , the emu was an important source of meat to Aboriginal Australians . They used the fat as bush medicine and rubbed it into their skin . It served as a

valuable lubricant , was used to oil wooden tools and utensils such as the coolamon , and was mixed with ochre to make the traditional paint for ceremonial body adornment .

An example of how the emu was cooked comes from the Arrernte of Central Australia who called it Kere ankerre :

" Emus are around all the time , in green times and dry times . You pluck the feathers out first , then pull out the crop from the stomach , and put in the feathers you 've pulled out , and then singe it on the fire . You wrap the milk guts that you 've pulled out into something [such as] gum leaves and cook them . When you 've got the fat off , you cut the meat up and cook it on fire made from river red gum wood . "

The birds were a food and fuel source for early European settlers , and are now farmed , in Australia and elsewhere , for their meat , oil and leather . Commercial emu farming started in Western Australia around 1970 . The commercial industry in the country is based on stock bred in captivity , and all states except Tasmania have licensing requirements to protect wild emus . Outside Australia , emus are farmed on a large scale in North America , with about 1 million birds in the US , Peru , and China , and to a lesser extent in some other countries . Emus breed well in captivity , and are kept in large open pens to avoid the leg and digestive problems that arise from inactivity . They are typically fed on grain supplemented by grazing , and are slaughtered at 15 to 18 months .

The Salem district administration in India advised farmers in 2012 not to invest in the emu business which was being heavily promoted at the time ; further investigation was needed to assess the profitability of farming the birds in India . In the United States , it was reported in 2013 that many ranchers had left the emu business ; it was estimated that the number of growers had dropped from over five thousand in 1998 to one or two thousand in 2013 . The remaining growers increasingly rely on sales of oil for their profit , although , leather , eggs , and meat are also sold .

Emus are farmed primarily for their meat , leather , feathers and oil , and 95 % of the carcass can be used . Emu meat is a low @-@ fat product (less than 1 @.@ 5 % fat) , and is comparable to other lean meats . Most of the usable portions (the best cuts come from the thigh and the larger muscles of the drum or lower leg) are , like other poultry , dark meat ; emu meat is considered for cooking purposes by the US Food and Drug Administration to be a red meat because its red colour and pH value approximate that of beef , but for inspection purposes it is considered to be poultry . Emu fat is rendered to produce oil for cosmetics , dietary supplements , and therapeutic products . The oil is obtained from the subcutaneous and retroperitoneal fat ; the macerated adipose tissue is heated and the liquefied fat is filtered to get a clear oil . This consists mainly of fatty acids of which oleic acid (42 %) , linoleic and palmitic acids (21 % each) are the most prominent components . It also contains various anti @-@ oxidants , notably carotenoids and flavones .

There is some evidence that the oil has anti @-@ inflammatory properties ; however , there have not yet been extensive tests , and the USDA regards pure emu oil as an unapproved drug and highlighted it in a 2009 article entitled " How to Spot Health Fraud " . Nevertheless , the oil has been linked to the easing of gastrointestinal inflammation , and tests on rats have shown that it has a significant effect in treating arthritis and joint pain , more so than olive or fish oils . It has been scientifically shown to improve the rate of wound healing , but the mechanism responsible for this effect is not understood . A 2008 study has claimed that emu oil has a better anti @-@ oxidative and anti @-@ inflammatory potential than ostrich oil , and linked this to emu oil 's higher proportion of unsaturated to saturated fatty acids . While there are no scientific studies showing that emu oil is effective in humans , it is marketed and promoted as a dietary supplement with a wide variety of claimed health benefits . Commercially marketed emu oil supplements are poorly standardised .

Emu leather has a distinctive patterned surface , due to a raised area around the feather follicles in the skin ; the leather is used in such items as wallets , handbags , shoes and clothes , often in combination with other leathers . The feathers and eggs are used in decorative arts and crafts . In particular , emptied emu eggs have been engraved with portraits , similar to cameos , and scenes of Australian native animals .

= = = Cultural references = = =

The emu has a prominent place in Australian Aboriginal mythology , including a creation myth of the Yuwaalaraay and other groups in New South Wales who say that the sun was made by throwing an emu 's egg into the sky ; the bird features in numerous aetiological stories told across a number of Aboriginal groups . One story from Western Australia holds that a man once annoyed a small bird , who responded by throwing a boomerang , severing the arms of the man and transforming him into a flightless emu . The Kurdaitcha man of Central Australia is said to wear sandals made of emu feathers to mask his footprints . Many Aboriginal language groups throughout Australia have a tradition that the dark dust lanes in the Milky Way represent a giant emu in the sky . Several of the Sydney rock engravings depict emus , and the birds are mimicked in indigenous dances .

The emu is popularly but unofficially considered as a faunal emblem ? the national bird of Australia . It appears as a shield bearer on the Coat of arms of Australia with the red kangaroo , and as a part of the Arms also appears on the Australian 50 cent coin . It has featured on numerous Australian postage stamps , including a pre @-@ federation New South Wales 100th Anniversary issue from 1888 , which featured a 2 pence blue emu stamp , a 36 cent stamp released in 1986 , and a \$ 1 @.@ 35 stamp released in 1994 . The hats of the Australian Light Horse are decorated with emu feather plumes .

There are around six hundred gazetted places in Australia with " emu " in their title , including mountains , lakes , hills , plains , creeks and waterholes . During the 19th and 20th centuries , many Australian companies and household products were named after the bird . In Western Australia , Emu beer has been produced since the early 20th century and the Swan Brewery continues to produce a range of beers branded as " Emu " . The quarterly peer @-@ reviewed journal of the Royal Australasian Ornithologists Union , also known as Birds Australia , is entitled Emu : Austral Ornithology .

The comedian Rod Hull featured a wayward emu puppet in his act for many years and the bird returned to the small screen in the hands of his son after the puppeteer 's untimely death .

= = Status and conservation = =

In John Gould 's Handbook to the Birds of Australia , first published in 1865 , he lamented the loss of the emu from Tasmania , where it had become rare and has since become extinct ; he noted that emus were no longer common in the vicinity of Sydney and proposed that the species be given protected status . In the 1930s , emu killings in Western Australia peaked at 57 @,@ 000 , and culls were also mounted in Queensland during this period due to rampant crop damage . In the 1960s , bounties were still being paid in Western Australia for killing emus , but since then , wild emus have been granted formal protection under the Environment Protection and Biodiversity Conservation Act 1999 . Their occurrence range is between 4 @,@ 240 @,@ 000 and 6 @,@ 730 @,@ 000 km2 (1 @,@ 640 @,@ 000 ? 2 @,@ 600 @,@ 000 sq mi) , and a 1992 census suggested that their total population was between 630 @,@ 000 and 725 @,@ 000 . As of 2012 , the International Union for Conservation of Nature considers their population trend to be stable and assesses their conservation status as being of least concern . The isolated emu population of the New South Wales North Coast Bioregion and Port Stephens is listed as endangered by the New South Wales Government .

Although the population of emus on mainland Australia is thought to be higher now than it was before European settlement , some local populations are at risk of extinction . The threats faced by emus include the clearance and fragmentation of areas of suitable habitat , deliberate slaughter , collisions with vehicles and predation of the eggs and young .