

Green iguana

Iguana iguana



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Summary

Iguana iguana (green iguana or common iguana) is a large lizard native to an extensive area of tropical America. Its diet includes a wide range of leafy plants, flowers and ripe fruit. A small amount of animal matter, including invertebrates, bird nestlings and eggs are occasionally consumed. Green iguanas are diurnal and generally arboreal (tree-dwelling). They often live close to water and readily swim underwater to escape danger. Their preferred habitat includes tropical forest (rainforest and riparian vegetation) and disturbed sites.

Green iguanas are one of the most popular exotic reptilian pets in the United States, where more than 1.1 million were imported in 1995 alone. Keeping them as pets is prohibited in Queensland, but small numbers are held under permit in various zoos. At present, there are no records of naturalised iguanas in Queensland or Australia. However, a single wild specimen was recorded in the Ross River in Townsville in April 2011.

This risk assessment presents evidence that green iguanas have several attributes that confer pest risk in Queensland: (1) a history as a pest overseas (naturalised populations in Florida, California, Hawaii, Fiji and elsewhere), (2) a preference for tropical and subtropical climates (climate match), (3) an extensive native distribution, (4) relatively high fecundity and (5) a broad, non-specialised diet.

Evidence from Florida suggests that the economic impact of green iguanas is currently relatively minor. However, long-term impacts on the environment are difficult to predict. Green iguanas consume the foliage of a range of plants, including endangered native plants, as well as invertebrates and bird eggs and nestlings. The impact of green iguanas in Queensland is expected to be comparable to the impact experienced in Florida, where the species numbers in the tens of thousands. Climate modelling suggests that climate along the eastern coast of Queensland is highly suitable for the species, with coastal North Queensland most suitable. Based on the available evidence, green iguanas can be considered high risk and a precautionary approach to their management in Queensland appears wise.

Introduction

Identity and taxonomy

Species identity: *Iguana iguana* Haswell, 1883

Synonyms: *Iguana hernandessi*, *Iguana rhinolopha*, *Iguana tuberculata* and as many as 25 other names

Common names: common green iguana, green iguana, common iguana

Description and biology

Iguana iguana is a large lizard, generally up to 1.5 m from head to tail, but sometimes up to 2 m. Animals usually weigh 4–6 kg but can reach 9 kg.

Distinctive features include:

- prominent hanging dewlap under the throat (larger in males)
- dorsal crest of robust dermal spines running from neck to tail
- a set of large scales on each side of the head
- membrane-covered tympanum (hearing structure)
- long, tapering, variably ringed tail.

Despite the animal's name, colour is variable across its native range—including green to grey-green, bluish-green with bold black markings (e.g. in Peru), lavender, black, reddish to orange (Costa Rica and Mexico) and even pinkish (on Caribbean islands) (Figures 1 and 2). Juveniles from El Salvador are sometimes bright blue, becoming greener as they mature. The whip-like tail can deliver a painful blow. The dewlap helps regulate body temperature and is also used in courtship and territorial displays.



Figure 1. Green iguana (Photo by Vladimir Dinets, University of Miami, Bugwood.org. Used with permission)



Figure 2. Orange-coloured form of green iguana (Photo by Tony Pernas, USDI National Park Service, Bugwood.org. Used with permission)

Reproduction and dispersal

Breeding starts when animals are three to four years old. Females lay clutches of 20–70 eggs once each year during a synchronised nesting period. Eggs are laid into burrows dug into the ground to a depth of 0.5–1 m. Females do not protect their eggs or offspring, but will defend their nest burrow during excavation. Eggs hatch after 90–120 days (at a nest temperature of 30–32 °C). Hatchlings are generally 17–25 cm long. Growth is relatively rapid and a 12 g hatchling can grow to 1 kg in three years. Juveniles are similar in appearance to adults but lack dorsal spines. Juveniles remain in family groups for the first year of life.

Captive-reared animals can live for over 20 years, but wild animals generally live for about eight years (De Vosjoli 1992, Frye 1995).

Individuals generally become reproductive at three to four years of age, although some animals mature up to a year earlier or later. Females remain reproductive for several years (Frye 1995). Peak breeding occurs in the dry season, ensuring that most young hatch in the wet season when food resources are most abundant. Females can store sperm for several years after mating, using it to fertilise eggs at a later date (De Vosjoli 1992; Frye 1995).

Diet

Mature iguanas are mostly herbivores, feeding on a range of leafy plants, flowers and ripe fruit. Leaves from over 100 different plant species are consumed. Diet occasionally includes certain animal material such as insects, lizards and other small animals, nestling birds and eggs (Kern 2009). Juveniles consume more animal material than adults, especially insects. Hatchling green iguanas eat the droppings of adult iguanas to acquire the gut bacteria essential for digesting plant material (Kern 2009).

Behaviour

Green iguanas are diurnal, arboreal (tree-dwelling) and often found near water. They are agile climbers. Green iguanas are exothermic and rely on environmental temperatures and behavioural thermoregulation (e.g. basking) to maintain optimal body temperature. Active foraging typically occurs at daytime temperatures of 25–35 °C. Lower temperatures suppress appetite and digestion (Frye 1995). During cold weather they often stay near the ground to keep warm.

Males are territorial against other males, but will tolerate females or juveniles. In Florida, these animals like to bask in open areas such as sidewalks, docks, seawalls, landscape timbers or open, mowed areas. When frightened, they dive into water, a behaviour displayed by Australia's native water dragon. A habit of diving into water (and staying submerged while swimming) makes green iguanas very difficult to capture (Kern 2009).

In Florida, northern range expansion of green iguanas appears to be limited by winter temperatures (Meshaka et al. 2004).

Origin and distribution

Green iguanas are native to Central and South America—their range extends over a large geographic area, from southern Brazil, Paraguay and Bolivia to southern Mexico and the Caribbean Islands (Grenada, Curacao, Trinidad and Tobago, Saint Lucia, Saint Vincent and Utila) (Lever 2003; GBIF n.d.) (Figure 3). Naturalised populations exist in Florida, California, Hawaii, Grand Cayman, Puerto Rico, Fiji (two islands), the Virgin Islands (US) and the Rio Grande Valley in Texas.



Figure 3. Locations where *Iguana iguana* has been recorded by the Global Biodiversity Information Facility (n.d.)

Conservation status

Green iguanas are listed in the Convention on International Trade in Endangered Species (CITES) II because of their overharvest for the international pet trade. While the green iguana is not endangered, CITES aims to ensure that trade in the species is restricted, so that the wild population is maintained.

Preferred habitat

Green iguanas prefer a tropical to subtropical climate, thriving when temperatures range from 26–35 °C.

Preferred habitat is tropical forest, including rainforest and riparian forests (including mangroves). In Florida and elsewhere, they often show a preference for disturbed sites where trees overhang freshwater (lakes, creeks etc.).

When subject to cold weather, green iguanas have been observed falling from trees. In January 2008, large numbers of feral iguanas in Florida ‘dropped from the trees’ due to unusually cold night-time temperatures. Cold temperature disrupts the animal’s metabolism. Local media described the phenomenon as a ‘frozen iguana shower’ in which dozens ‘littered’ local bike paths. This event was repeated in January 2010 after a prolonged cold front affected southern Florida.

History as a pest elsewhere

Green iguanas have naturalised in Florida, California, Hawaii, Grand Cayman, Puerto Rico, the Virgin Islands (US) and the Rio Grande Valley in Texas.

In Florida, damage caused by iguanas includes eating valuable landscape plants, shrubs and trees; orchids and many other flowers; and ripe fruit such as berries, figs, mangoes, tomatoes, bananas and lychees. Preferred foliage includes hibiscus, orchids, bougainvilleas, roses, nasturtiums, garden greens (broccoli, mustard, sorrel, beets, lettuces), turf grasses and a range of weeds.

Originally introduced into Florida as early as 1966, green iguana numbers now exceed several tens of thousands, with some estimates of several hundred thousand. They are frequently seen in the Everglades National Park. While their impact on native ecosystems in Florida and elsewhere is poorly studied and described, they are known to consume the native endangered plant *Cordia globosa* and Nickernut (*Caesalpinia* sp.), a primary food plant of the endangered Miami blue butterfly (*Cyclargus thomasi bethunebakeri*). On Marco Island, green iguanas have been seen using the burrows of the Florida burrowing owl, a species of conservation concern, suggesting their ecological impact may be more significant than originally thought. Meshaka et al. (2004) and McKie et al. (2005) expressed concern over the potential for iguanas to destroy bird nestlings and eggs.

Green iguanas dig substantial burrows that can undermine sidewalks, seawalls and foundations. Burrows located next to seawalls facilitate erosion and eventual collapse of the seawalls.

Basking areas tend to become littered with droppings, causing complaints from local residents.

The potential economic impact of green iguanas in Florida is believed to be minor, and is mostly related to damage to tropical gardens and landscape foliage plants (Gingell and Harding 2005). While iguanas carry salmonella, human health impacts are considered very minimal.

Adult iguanas are large, powerful animals. When threatened they can bite, cause severe scratch wounds and deliver a painful slap with their tail. Iguanas normally avoid people but will defend themselves against dogs and cats and people who try to catch them or corner them. However, once accustomed to people they can become very placid and tame (making them good pets).

Other iguana species naturalised in Florida are the Mexican spiny-tailed iguana (*Ctenosaura pectinata*) and black spiny-tailed iguana (*C. similis*).

Green iguanas have been banned as pets in New York and Hawaii. In response to their potential impact on Hawaii's ecosystems, import and possession carries a three-year jail sentence and a fine up to \$200 000. Green iguanas naturalised in Hawaii in the 1950s (Lever 2003).

The impacts of green iguanas in Hawaii and elsewhere are poorly described. In Guadeloupe, green iguanas have 'almost if not totally replaced the native *Iguana delicatissima* through interbreeding and competition for food and nesting sites' (Lever 2003).

Green iguanas are reported to be posing a collision hazard on airport runways in Puerto Rico (Invasive Species Specialist Group 2010).

Pest potential in Queensland

Current distribution and impact in Queensland and Australia

At present, there are no records of naturalised green iguanas in Queensland, or Australia. However, a wild specimen was recorded in the Ross River in Townsville in April 2011 (Figure 4).



Figure 4. A wild green iguana in the Ross River, Townsville (Photo by Betsy Roznik, 16 April 2011)

Potential distribution and impact in Queensland and Australia

Climate-matching software called Climatch (Bureau of Rural Sciences 2009) was applied to predict areas of Queensland where climate is similar to that experienced across the native and naturalised range of green iguanas. Most of coastal Queensland appears to offer favourable climate for the species, with substantial areas of North Queensland appearing to be highly suitable (Figure 5).

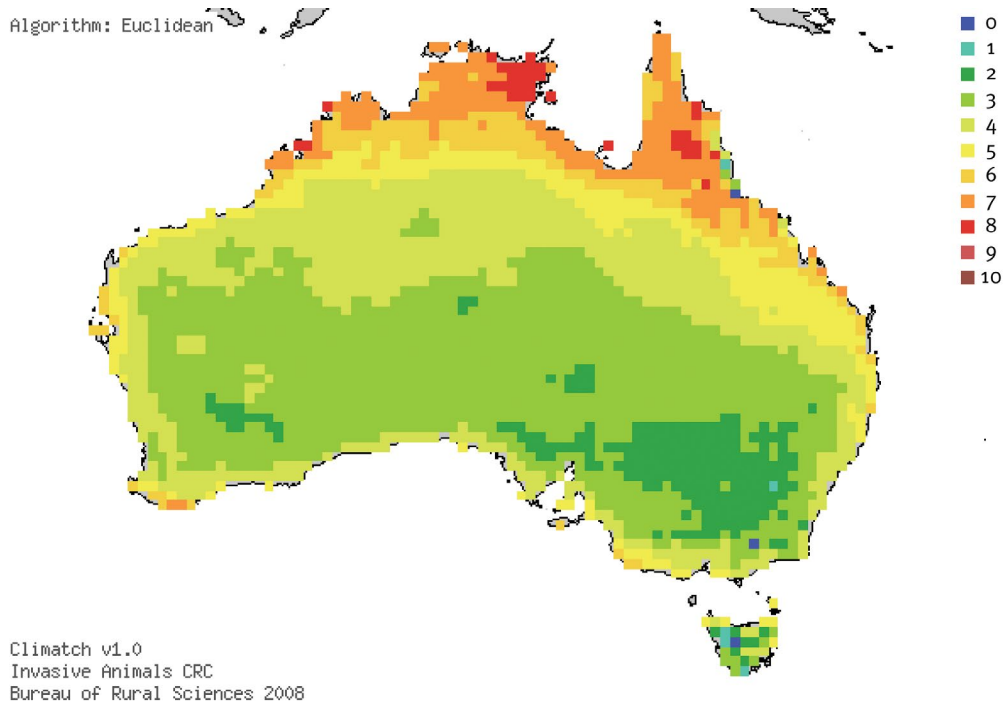


Figure 5. Areas of Australia where climate appears suitable for survival of *Iguana iguana* (green iguana). Red and dark orange are highly suitable, light orange and yellow are marginally suitable, and green, blue and white are unsuitable. Map produced using Climatch computer software (Bureau of Rural Sciences 2009)

This assessment presents evidence that green iguanas have several attributes that confer pest risk in Queensland:

- a history as a pest overseas (Florida, Hawaii, etc.)
- a preference for tropical and subtropical climates (climate match)
- an extensive native range
- a broad, non-specialised diet (mainly herbivores)
- relatively high fecundity (high rate of reproduction).

Hence, it seems reasonable to conclude that the species is highly likely to form a wild (naturalised) population in Queensland, if provided with an opportunity. While its potential impacts are difficult to predict, experience in Florida, where the species has existed since 1966, provides a useful guide. In Florida, its economic impact has been described as minor, with most impact limited to damage to foliage plants and ripe fruit in gardens. However, its environmental impacts are poorly studied and more difficult to predict. The species is known to eat bird nestlings and eggs, so it might have some impact on native bird populations. There is also evidence of herbivory on endangered native plants in Florida, with subsequent impacts on dependant native wildlife. In urban environments, including cities and towns along the east coast of Queensland, green iguanas could become abundant. Abundance could easily exceed tens of thousands in Brisbane, which has climatic and habitat parameters comparable to southern Florida, where the species has become locally abundant.

Threat to human safety

Green iguanas have sharp teeth capable of shredding leaves and human skin. Their tail can deliver a painful blow. Like most reptiles, green iguanas carry salmonella.

Risk of naturalisation

Green iguanas are highly likely to be kept (illegally) as pets in Queensland, albeit in low numbers. As has occurred in numerous places overseas, dumping of unwanted pets is inevitable. Individuals dumped into favourable habitats, especially in coastal North Queensland, are highly likely to survive. The development of a naturalised population will depend on the dumping (or escape) of several males and females at a time. Single specimens cannot naturalise.

Feasibility of eradication

Once naturalised, eradication is predicted to be very difficult. Green iguanas tend to live close to water where they can readily dive in and escape by swimming underwater. They are also arboreal (tree-dwelling) and well camouflaged.

Eradication of small populations on two islands in Fiji is currently underway (the species was first detected in 2000). To date, over \$250 000 has been spent. The Invasive Species Specialist Group (2010) reported that ‘The Fiji Department of Environment has set up a taskforce to oversee the incursion response to the introduction and spread of the Green Iguana. Qamea and Matagi, Laucala and Taveuni have been declared as a biosecurity zone by the Ministry of Primary Industry and the transporting of Green Iguanas between islands is prohibited’.

An unsuccessful eradication effort was reported in the Lesser Antilles (Anguilla) in 1999, where green iguanas posed a threat to the locally native *Iguana delicatissima* (Invasive Species Specialist Group 2010).

Since eradication is challenging, management efforts need to focus on preventative restrictions on import (border restrictions) combined with synergistic post-border restrictions in the form of restrictions on possession and sale. As there is a strong commercial incentive to smuggle green iguanas into Queensland, border and post-border restrictions need to be well enforced.

Control

For information on trapping green iguanas refer to Kern (2009).

References

Bureau of Rural Sciences (2009). *Climatch*. Canberra: Department of Agriculture, Fisheries and Forestry. Retrieved from adl.brs.gov.au:8080/Climatch

De Vosjoli, P. (1992). *The green iguana manual*. Lakeside, California: Advanced Vivarium Systems.

Frye, F. (1995). *Iguana iguana: guide for successful captive care*. Florida: Krieger Publishing Company.

GBIF *see* Global Biodiversity Information Facility

Gingell, F. *Biology of amphibians and reptiles* and Harding, J. (2005). *Iguana iguana*, Animal Diversity Web. Retrieved 08 August 2011 from http://animaldiversity.ummz.umich.edu/site/accounts/information/Iguana_iguana.html

Global Biodiversity Information Facility (n.d.). *Iguana iguana*. Retrieved from <http://data.gbif.org/species/13499669/>

Invasive Species Specialist Group (2010). *Iguana iguana*, Retrieved from www.issg.org/database/species/management_info.asp?si=1022&fr=1&sts=sss&lang=FR&ver=print&prtflag=false

Kern, W.H. Jr (2009). *Dealing with iguanas in the South Florida landscape*. Fact Sheet ENY-714. Davie, Florida: Florida Cooperative Extension Service, University of Florida. Retrieved from <http://edis.ifas.ufl.edu/in528>

Lever, C. (2003). *Naturalised reptiles and amphibians of the world*. Oxford: Oxford University Press.

McKie, A.C., Hammond, J.E., Smith, H.T., and Meshaka, W.E. (2005). Invasive green iguana interactions in a burrowing owl colony in Florida, *Florida Field Naturalist* 33: 125–127.

Meshaka, W.E., Bartlett, R.D., and Smith, H.T. (2004). Colonisation success by green iguana in Florida. *Iguana* 11: 154–161.

Meshaka, W.E., Smith, H.T., Golden, E., Moore, J.A., Fitchett, S., Cown, E.M., Engeman, R.M., Sekscienski, S.R. and Cress, H.L. (2007). Green iguanas (*Iguana iguana*): The unintended consequence of sound wildlife management practices in a South Florida park. *Herpetological Conservation and Biology* 2(2): 149–156.