

Plate 10: Distribution of camphor laurel in the Richmond catchment produced from DLWC mapping. Light green areas indicate camphor laurel presence (1-49%). Dark green areas represent camphor laurel-dominated forests (> 50%).



1.4 Positives and negatives of camphor laurels

Camphor laurels are spreading at an alarming rate on the NSW north coast, invading both agricultural land and areas of native vegetation. There is an urgent need to take action now, however, as the next section highlights, there are both positive and negative aspects of the species and these need to be considered when planning control programs.

1.4.1 Negative values

Large number of seeds: Mature camphor laurels can produce over 110,000 seeds per plant per year (Firth 1979). Birds and some other fauna species readily disperse the seeds in surrounding areas. In a study of camphor laurel seed “rain” and seedling ecology, Stewart (2000) recorded peak seed rain densities of 1-3 seeds per square metre per fortnight from two different sites. The main camphor laurel seed rain period is over a substantial length of time (i.e April to September) (Stewart 2000).

Competitive advantage of seeds: Camphor laurel seeds have an in-built seed dormancy. In laboratory experiments, Firth (1979) found that camphor laurel seeds took between 4 and 20 weeks to germinate. This, accompanied with the long fruiting time, ensures that seedlings emerge over a very long period (Stewart 2000). The 4-20 week dormancy period allows camphor laurels to germinate at the start of the wet season (and miss the dry season), giving them maximum opportunity to grow and establish before the next winter / dry season and before other species become established. Camphor laurel seeds may still be viable after being under water for 40 days (Firth 1979).

Competitive advantage of the tree: Camphor laurel roots form a dense mat close to the soil surface over substantial areas and hence restrict the growth of native seedlings (Firth 1979, O'Brien pers. comm.). This competitive advantage can be readily observed in dry periods when grasses growing underneath the tree die well before grasses growing in surrounding areas. The dense shade provided by the tree has been observed to outcompete and kill some native species growing nearby such as red cedar, teak, white beech, scrub ironbark and foambark (O'Brien, pers. comm.). Other species including the restricted Red Boppel Nut, Macadamia and Davidson's Plum have been observed persisting but unable to set fruit underneath camphor laurels (O'Brien, pers. comm.).

Camphor laurel seeds and trees may restrict the growth of other species growing near them through altering the soil chemistry (Firth 1979).

Few natural predators: Although Stewart's (2000) study found that most camphor laurel seedlings did not survive the first 2 years, camphor laurels have few natural predators compared with native plants (Firth 1979).

Incredible rate of spread: Approximately 1/3 of all camphor laurels growing on the NSW north coast are under 3 years in age (pers. obs., North Coast Weed Advisory Committee, pers. comm.), indicating a phenomenal rate of spread. Camphor laurels are invading agricultural land and areas of native vegetation. Although predominantly occurring on more fertile soils such as floodplains, camphor laurels are increasingly invading eucalypt forests on hillsides as well as less fertile areas in the west of the region.

Ability to form monocultures and associations with other weeds: Camphor laurels readily form single species-dominant communities, particularly in the upper stratum (Firth 1979), and hence have a long-term impact on native species diversity. Camphor laurels also commonly occur in association with other weed species such as lantana (*Lantana camara*) and privets (*Ligustrum spp.*) (e.g Scanlon 1998, 1999, Scott, pers. comm.). Monocultures of camphor laurel result in reduced numbers of mature native fruit

producing species that fruit in the critical August to December period when there are few native food sources for frugivorous fauna (Floyd 1990).

Destabilisation of streambanks and steep slopes: As camphor laurel understoreys often lack the vegetation growth of diverse native forests they, and areas downstream, are more prone to soil erosion due to the increase in velocity of water travelling down the slope (pers. obs., O'Brien, pers. comm., Hungerford, pers. comm.). Streambanks infested with camphor laurels can be more prone to undercutting due to the shallow nature of their roots enabling flood waters to scour out underneath them (Sainty, pers. comm., Hungerford, pers. comm.).

Blockage of natural succession: Camphor laurel's highly competitive characteristics enable it to block natural succession and regeneration processes of native forests (e.g Firth 1979, Joseph, pers. comm., Bower, pers. comm.). It is not currently known whether camphor laurels will continue to dominate forest areas or whether other native species may be able to persist and eventually take over (e.g Firth 1979, Shenk and Wallace 1996). Either way, this is of particular concern to the conservation of threatened species as camphor laurels are so long-lived (over 500 years in China: Firth 1979). Threatened species that are impacted by them may not be able to survive in adequate numbers until that occurs (if it does!).

Expensive to control: Camphor laurels can be expensive to control, particularly in core areas where they dominate the environment. Public utility providers and Councils need to regularly control them under power lines, on roadsides and near other infrastructure.

Poisonous to fish fingerlings: A study in the Upper Orara River, west of Coffs Harbour, found that both crushed and un-crushed camphor laurel leaves were poisonous to Rainbow Fish fingerlings (Bishop 1993). The study was made following claims by local farmers that no fish were found in areas infested with camphor laurels.

May be poisonous to some other fauna: A masters research project is currently being undertaken to analyse the impacts of camphor laurel on aquatic biota in the Tweed catchment (Pahlow, pers. comm.). A number of anecdotal reports claim that camphor laurels (all parts of the tree) may be poisonous to native frogs, chickens, geese and native bird species, although no published scientific research has been undertaken to date to substantiate these claims.

1.4.2 Positive values

A tree: It produces oxygen and stores carbon, elements that assist human survival.

Street tree: Camphor laurels were planted extensively as street trees throughout the 20th century and attractive mature trees are in schools, parks, urban roadsides, church grounds and cemeteries.

Shade tree: Camphor laurels have been planted in some agricultural areas for stock shelter, particularly the Richmond-Brunswick-Tweed catchments, following large-scale clearing of lowland subtropical rainforest and other vegetation (e.g In the former Big Scrub area alone, approximately 75,000 hectares of forest was reduced to approximately 100 hectares, i.e 99.86% cleared: Hunter 1999). Throughout the region, camphor laurels have invaded agricultural areas and these often still comprise the only shade trees.

Habitat for native flora and fauna: Although camphor laurel-dominated forests are generally not as diverse as native forests, they can provide important habitat for a range of plant and animal species. For example, Shenk and Wallace (1996) found that 30 out of 32 camphor laurel-dominated forests studied in Tweed Shire also supported rare / significant plants. Habitat values include shade, shelter and protection, roosting / perch

sites (and hence aid seed dispersal), nesting sites and food (from camphor laurels and other species). The importance of camphor laurels as “stepping stones” for the movement of fauna between native forest remnants in the northern rivers area has been well-documented (e.g Date et. al. 1991, Recher et. al. 1995, Date et. al. 1996).

Important food source for fauna: Camphor laurels provide an important winter food source for frugivorous (fruit-eating) fauna (e.g Frith 1982, Holmes 1987, Innis 1989), particularly for the topknot (*Lopholaimus antarcticus*) and white-headed fruit-doves (*Columba leucomela*) (Hackett, pers. comm.). This is due to the large-scale clearing of lowland rainforest, which historically supported a range of fruiting species at that time (see page 6.15). The wompoo (*Ptilinopus magnificus*), rose-crowned (*P. regina*) and superb fruit-doves (*P. superbus*) and the black (*Pteropus alecto*) and grey-headed flying fox (*Pteropus poliocephalus*), all threatened with extinction, also eat camphor laurel fruits from time-to-time (Hackett, pers. comm., Holmes 1987, Bower, pers. comm.).

As camphor laurels limit the number of native species that can grow to maturity they do, however, lead to a reduction in fruiting species available at other times of the year. They can therefore lead to a reduced number of species fruiting in spring when there are few native food sources.

Can help re-establish native vegetation: Although camphor laurels may stop, or at least restrict the regeneration of native forests (e.g Firth 1979), they can help re-establish areas of native vegetation due to the high number of native seedlings that can germinate underneath them (e.g Shenk and Wallace 1996, Woodford, pers. comm.). Camphor laurels may also restrict the growth of other weed species. When camphor laurels and other weeds are controlled gradually and native regeneration is protected, these areas may largely regenerate on their own, apart from follow-up weed control and some planting to improve diversity and structure if needed (see chapter 6.2.4).

Soil stabiliser: Although camphor laurels can exacerbate erosion, they can provide some soil stability when compared to little or no vegetation.

Inability to invade in dense shade: Camphor laurels do not readily invade heavily shaded environments unless there is some disturbance or opening up of the canopy (pers. obs., Joseph, pers. comm., Bower, pers. comm.).

Provides some benefits for riparian zones: Growth and shade of camphor laurels near waterways can decrease water temperatures and reduce flow velocities.

Resource values: Products such as sawlogs, boards, slabs, plywood, furniture, camphor oil, electricity and woodworking products make it a valued resource (currently worth approximately \$1 million/ year and able to expand greatly (Stubbs et. al. 1999)).