HOTSPOTS FIRE PROJECT

Case Study: Heath-leaved Banksia

A flower of *Banksia ericifolia subs macrantha*

Fire Timing Vital for Survival

Heath-leaved banksia: *Banksia ericifolia*

A member of the protea family, *Banksia ericifolia* is unique to the coastal regions of New South Wales. It takes 5 to 8 years for this dense shrub to reach maturity and produce seed. Most seeds are released from the woody cones only after the parent plant is killed by fire. If the coastal heathland in which it occurs is burnt at intervals of less than 7 or 8 years, or if it is not burnt at all, this plant can become locally extinct.

Distribution

There are two subspecies of the heath-leaved banksia:

- *Banksia ericifolia* subspecies *ericifolia* occurs along the Sydney coast as far south as Jervis Bay and on the adjacent ranges.
- *Banksia ericifolia* subspecies *macrantha*. This northern sub-species occurs in coastal heathland from Forster to Nambucca Heads and from Wooli to Tweed Heads.

Appearance

The heath-leaved banksia is a dense shrub or small tree with spiky, dark green leaves. The erect buds, which appear in autumn and winter, resemble old-fashioned plastic hair curlers. These open into long, flame-coloured flower heads. *Banksia ericifolia* subspecies *macrantha* has larger, more deeply coloured flowers than the southern variety. The individual flower spikes of this subspecies can grow up to 25 centimetres long.

Life history and fire

Individual plants can live from 25 to 60 years. It takes 5 to 8 years for a young plant to produce its first flowers and another year for the cones to ripen. The plant usually builds up a very healthy seed bank by 10 years of age.

Pollinators including birds and mammals are attracted to the sweet nectar contained in each flower.

Banksia ericifolia is an obligate seeder. Unlike many other banksias that will resprout after fire, this species is obliged to regenerate from seed. The seed is protected in woody follicles that resemble pursed lips studding the cone.

Alex Floyd, honorary curator of the North Coast Regional Botanic Gardens herbarium, explains that follicles release their seeds only once the branch on which they grow dies.

Being an obligate seeder, *Banksia ericifolia* is sensitive to frequent fires. “If they are to grow happily they want an interval of 8 years or longer between fires,” according to Dr Ross Bradstock, principal research scientist with the NSW Department of Environment and Conservation.

After fire, the follicles open on a heath-leaved banksia cone.

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Bradstock, a fire ecologist who has done several studies on Banksia ericifolia, says "The paradox is too many fires will destroy it, but if you don't have fire in the mature part of the plant's lifespan you will also lose it." He explains that dense stands of mature heath-leaved banksias need to be burnt so the species can regenerate. "Seedlings do not readily germinate or establish under a live canopy of vegetation."

"With *Banksia ericifolia*, as with so many other species, you can't have too little fire or too much," says Bradstock.

This banksia is a dominant species in many heathland communities. Birds and small mammals, like sugar gliders and pygmy possums, rely on *Banksia ericifolia* for nectar and for shelter. "If you crank up the frequency of fires you will simplify the habitat and lose these animals," warns Bradstock.

At the same time, longer fire intervals threaten not only populations of *Banksia ericifolia*, but also smaller plant species that grow with it. By 15 years after fire *Banksia ericifolia* thickets will overshadow other species. Meanwhile it will have developed a very large store of seeds, so that when fire occurs at 15-30 year intervals, postfire seed regeneration of this species will be massive and high density thickets will leave little space for other species. Occasional interfire intervals of 7-8 years are important to provide space for smaller species to build up their numbers.

Other species of banksia that occur in the Northern Rivers region have several ways of recovering from fire and so are more resistant to frequent fires. The Wallum banksia (*Banksia aemula*) which has serrated leaves and pale yellow or creamy green flowers has three survival strategies. The parent plant can regenerate from lignotubers underground and resprout from epicormic shoots above ground as well as releasing seed after fire.

Wallum banksias can live for a century and survive in frequently burnt heath. So if heathland is burnt at regular 6 year intervals, *Banksia ericifolia* will tend to disappear from the community while the Wallum banksias are likely to survive.

The hairpin banksia, *Banksia spinulosa* subspecies *collina* grows in wet sclerophyll forest and in heathland. It has needle-like leaves and golden yellow flowers with brownstyles like wire hairpins. The hairpin banksia will release seed in response to fire, but it too has a lignotuber that allows adult plants to resprout after fire.

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WHAT LANDHOLDERS CAN DO

Burning for biodiversity is a balancing act. In determining how frequently a vegetation type like heathland needs to be burnt scientists take account of the requirements of the whole community of plants as well as the fire sensitivity of each species. In coastal heathland, where most banksias occur, the requirements of different species of plants, animals and birds have all been factored into determining minimum and maximum fire thresholds.

In the Northern Rivers region the recommended burning frequency for coastal heathland is 7 to 30 years. Landholders should vary the frequency, intensity and timing of fires. If possible they should co-operate with neighbours in creating a mosaic of burnt and unburnt patches. In planning a fire regime for native vegetation on your property, consult with your nearest Rural Fire Services Fire Control Centre.

The Wallum banksia can survive fires.

Acknowledgements

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Reading

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Further Information

The Hotspots Fire Project is managed by the Nature Conservation Council of NSW. It was funded by the New South Wales government through its Environmental Trust.

For further information contact the project co-ordinator on (02) 9279 2466 or visit our website at www.hotspotsfireproject.org.au

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