

Distribution and spread of watsonia in the Southern Forest Region of Western Australia

Murray Carter, Department of Conservation and Land Management, PO Box 20, Pemberton, WA 6260, Australia.

Watsonia species were brought into the Southern Forest Region of Western Australia with the introduction of the group settlement scheme in the mid nineteen twenties. The plants were used as garden ornamentals and quickly became established at most group sites. Following group settlement a network of railways were constructed along which small settlements were established to service the lines. These also were a major cause of watsonia introduction into the region.

The ongoing firebreak maintenance adjacent to railway formations caused the greatest rates of watsonia spread and has resulted in almost seventy per cent of existing railway lines within the region being infested by watsonia.

Maintenance grading of roads adjacent to ex-group settlement sites has also contributed to the spread of watsonia although not on as large a scale as the railway network. Within the Shire of

Manjimup boundary, of approximately two thousand kilometres of road under the control of authorities other than the Department of Conservation and Land Management (CALM), slightly more than ten percent by length of these are infested by watsonia. The rate of infestation by length of CALM roads is negligible.

The greatest threat posed by watsonia within the Southern Forest Region is its ability to invade native vegetation. The region's high annual rainfall and abundance of moist sites make it ideal for watsonia to spread and establish. A good example of this is the karri forest understorey. This habitat is not generally conducive to the establishment of exotic species, however not so with watsonia. One mixed karri/marri site between Pemberton and Northcliffe has become so heavily infested by watsonia that all other scrub species are no longer present.

Whilst the spread of watsonia by me-

chanical means has already been discussed, another mode of spread which may prove as efficient is that of corms spreading down water courses. These stream zones also provide optimum conditions for the establishment of watsonia and their inaccessibility to vehicles may make future control programs very difficult. This ability of watsonia to spread via water carrying corms has already been displayed adjacent to the Peaceful Bay Road East of Walpole and adjacent to Scott Road within the D'Entrecasteaux National Park West of Pemberton.

The potential for this mode of spread to become devastating is present in many areas of the region, none more so than the Dombakup Brook, between Pemberton and Northcliffe. This area has become infested by watsonia via both mechanical spread along the main arterial road and the Pemberton to Northcliffe railway. The infestation is currently poised on the banks of the Dombakup Brook awaiting heavy stream flow conditions to un-earth some corms and transport these downstream. The area of native bushland put at risk by this mode of spread is substantial.

The profile of watsonia as an environmental weed needs to be lifted so as to ensure it does not become a common understorey species within the Southern Forest Region of Western Australia.

The Albany experience

Bob Howard, Friends of the Mountains, 19 Carlisle Street, Albany, WA 6330, Australia.

There are several species of plants loosely termed 'watsonia' growing around Albany. These are *Chasmanthe aethopica*, *Watsonia leipodoltii*, and *Watsonia meriana* as well as *Homeria* spp. (cape tulip).

Of these, the true watsonias, which have orange flowers, have by far the dominant position as a problem weed at the moment. Of the bulb type species which invade the sandy soils, however, bridal creeper (*Myrsiphyllum asparagoides*) appears to be a looming problem.

Watsonia does not appear to be limited by soil type or topographic variations in moisture in terms of the area it can colonize. However, the worst infestations do occur in wet areas.

Ecologically, the worst damage is done where watsonia has colonized on granite rock based moss and associated herb fields. Rock crevices are moisture holders so they are in effect another wet habitat. In these areas, in combination with fly grass (*Briza* sp.) we are seeing the local extinction of *Boryza* sedge and associated small rock face plants some of which are quite rare.

Watsonia invasion of woodland in combination with *Taylorina* leads to a complete replacement of the understorey with these two species. In heathlands and scrublands, watsonia is less of a problem because these areas are generally drier and watsonia is confined to tracks. There are examples of serious invasion, but these can usually be traced to human interference.

In general, watsonia invades following human disturbance. It is not widely spread by fire and established bulbs seem to be able to survive if they are deep enough into the ground. Conditions following fire favour the survival of cormlets as they germinate first. Fires on the edge of reserves where watsonia is present consequently pose the greatest risk to its spread.

Human spread of cormlets, intentionally, but unknowingly, by children and adults, and unintentionally attached to clothing, cuffs or shoes are probably the major means whereby it is introduced into new areas. Gravity and water are significant means of spread. Cormlets roll downhill readily.

Control

Over the last two years we have been experimenting with various methods on Mt Adelaide in a degraded area with significant areas of watsonia dominance, and also along tracks and paths where small patches had invaded otherwise undisturbed areas.

We have used Round-Up successfully to kill a large understorey infestation, but unfortunately we were not able to burn this area. The amount of dead material resulting from the unburnt watsonia and pampas grass has effectively stopped most germination of any extant bulbs and the area has been invaded by wild peas (*Genista*).

We used Dalapon on a sandy gully which was severely infected. This prevented flowering but did not kill the bulbs. This was late in the year (September). Dalapon was recommended after discussions with personnel from Main Roads who have had some success with this chemical.

We have gathered flower stems from over a large area of the above gully where