LC QON 269.PART 1.JACOB

Review of existing and future WRP translocation sites suitable for the release of animals displaced from the approved Busselton Hospital redevelopment.

Background – Translocation History

Sanctioned translocations of western ringtail possums have been undertaken by DEC and its predecessors since 1991. All translocations with one exception have been overseen and/or implemented by Paul deTores formerly of DEC's Science Division.

The current Translocation Proposal was approved (unconfirmed by SCB) in 2005 and identifies 2 sites as suitable for releasing WRP, these being Leschenault Peninsula Conservation Park (SWR) north of the Bunbury CBD, and the Martins Tank site in the Yalgorup NP (Swan R). It flags that if external funding became available the program would be expanded to include release sites at White Hills Road and Preston Beach Road in Yalgorup NP and Crampton NR (SWR) as an unbaited control site.

My understanding is that WRP were released at the White Hills and Preston Beach sites in addition to the Dwellingup portions of the Lane Poole Conservation Park but the Crampton NR site did not proceed.

All animals sourced for these operations have been wild animals displaced as a result habitat cleared during approved land developments and/or animals held by volunteer wildlife rehabilitators from the Dunsborough to Bunbury area. Detailed records are available for the development displaced animals between the period 1991 – 2008, rehabilitated animals released by Sci Div staff in the same period are not as readily available (Sci Div assistance required)

There is a long history of unsanctioned releases of WRP by wildlife rehabilitators dating back from the early 1980's (and before) to the current day at locations unknown by the department. A conservative estimate based on advice supplied by rehabilitators is that around 200 individual WRP have entered the rehabilitator network each year in Bunbury to Dunsborough area since the early 1980's. What percentage of these animals survive the rehabilitation process and are released is unknown, similarly there is no information available on the survival of individuals released illegally by rehabilitators. The implications are that it is highly probable that all remnant patches of habitat perceived by carers to be suitable habitat for WRP's between Augusta and Bunbury, particularly on private lands along the Leeuwin Naturaliste Ridge have had WRP released into them. Local DEC staff are aware of a few of these locations and advice from carers during the recent Margaret River fires revealed additional sites.

Recently two PhD studies – Clarke, J.R. (2011) Translocation Outcomes for the Western Ringtail Possum (*Pseudocheirus occidentalis*) in the Presence of the Common Brushtail Possum (*Trichosurus vulpecula*): Health, Survivorship and Habitat Use and Grimm (as yet unpublished) The ecology and health status of the wild Western Ringtail and Common Brushtail possum populations around the Busselton area have evaluated the health status and survival success of natural and translocated WRP.

Clarke concluded "*Overall, the results of this study showed that the survival rates of the 67 translocated P. occidentalis were unsustainably low. Although the ultimate cause of death for most P. occidentalis was predation, the survivorship analyses shed some light on possible proximate factors that may result in increased susceptibility to predation, or that might directly reduce long-term survival of individual animals. …. it is obviously important to improve current measures to reduce feral predator numbers…..*"

1) Consideration of existing and proposed release sites:

Leschenault Peninsula Conservation Park – SW Region

Pros – proximity to Busselton WRP source site, long established ground baiting program,

Cons – Inability to reduce predation impacts, conflicts with public use of the site, proven to have failed in the past, no operational solution to reducing predator densities.

1100 ha of coastal dunes supporting an open woodland of tuart over peppermint with secondary components of banksia sp, acacias sp over grass and sedges Understorey shrubs predominately absent to sparse in parts. The park has been ground baited monthly since 1990. Rainfall zone = 900mm

Given its proximity to Bunbury the park is a popular coastal access recreation site, with extensive use by 4WD's, off road vehicles, fishing and associated vandalism. Restricting vehicle access and dogs to most parts of the park is problematic.

10 + (unknown # rehab releases) translocations commencing in 1991 and continued to 2010? . A total of 109 + ? rehab animals have been released from land use developments(109) and wildlife rehabilitators. In 2002 the translocation program was deemed to have failed, unable to establish a self-sustaining viable population. Reasons for the failure are unclear but are thought to be strongly linked to high predation rates from cats, pythons, foxes and other predators. Sub-optimal habitat structure and composition may be facilitating access by predators.

Recent investigations by Clarke (2011) concluded "*The high P. occidentalis mortality rates observed in this study suggest that current levels of exotic predator control are inadequate for establishment and maintenance of translocated P. occidentalis populations, especially at Leschenault Peninsula. …..and overall predation rates were unacceptable at all three field sites during this study. "* (Leschenault Peninsula CP, and Martin's Tank, Preston Beach Rd within Yalgorup NP)

Currently there is no operational solution to reducing the predator densities or reducing the impacts of public access. Given the history and unresolved issues further releases of WRP to the Leschenault Peninsula Conservation Park are not supported by the South West Region.

Yalgorup National Park – Swan Region

Pros – some previous translocations successful and at least one viable population established, established ground baiting program

Cons - a viable population already established, two of the three release sites appear to have sustained only low density populations, high predation rate from introduced and native predators, long term persistence under climate change,

13,000 ha of consolidated dunes, ancient swales and lake systems supporting coastal heathlands, woodland of tuart, jarrah and marri over peppermint, banksia sp, acacia sp, understorey shrub layer largely intact. Comparatively limited public access and low levels of recreational use. Approx 2/3 of the park has been ground baited monthly commencing in 1995?, this baiting now reduced to bi monthly and the baited area increased (C.Olejnik pers com). Rainfall zone = 900mm

18 Translocations commenced in1995 and continued to 2008? . A total of 236+ (? rehab) animals have been released at 3 sites (White Hills Rd, Preston Beach Rd and Martins Tank) comprised of 236 animals from developments and an unknown number from rehabilitation. The translocation program has generally been cited as a success (De Tores) with at least one site (White Hills) having established a self-sustaining population and animals dispersing to urban areas to the north. A recently published PhD thesis (Clarke, J.R. 2011) investigating survival of translocated WRP at Yalgorup NP concluded " *More intensive fox-baiting, as well as the development of effective cat control measures appear necessary to improve P.occidentalis translocation success at coastal sites, especially if levels of predation by pythons and raptors remain high*." And "*Whatever other measures are carried out, effective control of exotic predators is absolutely essential. Exclusion of foxes and cats, if achievable, might alone or in combination with other measures be sufficient to enable the low-density translocated P. occidentalis populations to escape from the "predator pit", in which it appears likely they currently reside, and become sustainable in these sites*." The conservation value of further translocations in the absence of effective predator control is minimal.

The park is of sufficient size to have the capacity to receive more translocated WRP though other factors may limit the success of any future releases. Clarke (2011) "*Intra-specific competition among P. occidentalis themselves may also play a role in the current limitation of P. occidentalis survivorship at Martin's Tank and Preston Beach Road; at both these sites low density P. occidentalis populations derived from previous translocation attempts existed and may have limited the establishment of more recently introduced animals, especially if foliage nutrient quality was low*."

The long term persistence of populations in this location/habitat is questionable in consideration of climate change. Anecdotal observations and records of the distribution of WRP reveal a declining trend in the northern portions of the species range, with detectable levels of WRP having been lost over the last decade from habitat in the Darling Scarp/Jarrah Forest ecosystems at similar latitudes to the northern Yalgorup sites. This is consistent with an acknowledged general decline and southward contraction of many mammals species in the northern jarrah forest ecosystem.

Karakamia – Private Sanctuary Chidlow, Swan Region

Pros – previous translocations successful and a viable population established, predator proof fence

Cons – limited habitat available, a viable population already established, long term persistence under climate change questionable

A 275 ha predator proof fenced enclosure in the Chidlow area managed by the Australian Wildlife Conservancy located in the Darling Range northern Jarrah Forest ecosystem, dominated vegetation is jarrah, marri and wandoo woodlands with Rainfall zone = 800mm

A total of 30 (10 males and 20 females) were released into Karakmia Sanctuary between November 1995 and July 2001. In 2002 a further 12 wrp were translocated from Busselton and in December 2011 approval was given to relocate a further six held in captivity at Native Animal Rescue since 2008 & 2010 respectively. In 2010 an honours student confirmed that there was an established population at Karakamia and estimated 2.02 possums per ha in non-riparian habitat and 2.87 per ha in riparian habitat, with an overall population estimate of 28 wrp. De Tores (2011) concluded *"these results indicate the habitat is suitable to sustain a self perpetuating population."*

Clarke (2011) concluded "*Despite the presence of wedge tail eagles and occasional sightings of pythons, sufficient of the translocated P.occidentalis have survived and reproduced successfully to maintain an ongoing presence of this species within the enclosure at an unknown (but apparently low) density (AWC 2009). This emphasises the value of the total exclusion of introduced predator species for establishment of viable translocated populations of P.occidentali*s."

These translocations also demonstrated the capacity and resilience of animals originating in coastal habitats to adapt to non peppermint dominated habitat and prosper in a predator free environment.

Private Wildlife Sanctuaries in the Margaret River-Dunsborough area, South West Region

Three properties in the Margaret River-Dunsborough area have been established as private wildlife sanctuaries over the last decade. All have installed predator proof boundary fencing encompassing a mixture of cleared farmland and remnant vegetation principally riparian corridors. Property sizes vary from 19 - 40ha.The level of predator (fox) control inside the enclosures varies from regular and reliable to sporadic and infrequent. Rainfall zone = 1000m

Contact with the owners have confirmed that wildlife rehab'ers have already released a number of WRP into these sites over the last 5+ years without DEC authority or knowledge. None of the areas are of sufficient size to accommodate a release of 20+ animals. Only one of the sites can confirm WRP's being present and regularly observed, the other two have only a narrow strip of riparian habitat available and the owners haven't observed any WRP for some time. If animals persist they do so at low densities. These sites do not have the habitat capacity to support further releases or the owners have only agreed to receive a further 2 - 4 animals resulting from the recent Margaret River fire.

Proposed Translocation site

Perup Woylie Enclosure.

Pros – predator proof fence, habitat known to support WRP albeit at lower densities than coastal populations, active fauna research site with staff available.

Cons – limited riparian habitat available, genetic conservation considerations re: ,maintenance of genetic diversity of local WRP populations, may reduce capacity of site to receive translocations of local WRP's, medium to long term persistence under climate change,

420 ha predator proof fenced enclosure, dominant vegetation is open forest of jarrah, marri over scattered banksia sp, acacia sp, peppermint with low shrub layer. Flooded gum and melaleuca sp along watercourses . Rainfall zone = 700mm

The effectiveness of predator exclusion has been demonstrated by the breeding success of the captive woylie population. This removes the primary constraint to achieving a successful WRP translocation. Other considerations pertain to suitability of available habitat for animals originating from coastal ecosystems, however the results from Karakamia would suggest this is not a major factor. The potential for introduction of disease(s) which may impact on the woylie recovery program requires serious consideration, however these fears are not supported by the results of the health investigations by Grimm (a), Clarke (2011) or the evidence from de Tores health checks that preceded the majority of the WRP translocations completed to date.

Adrian Wayne (et al 2012) has circulated a summary of advice re: the genetics consideration and other WRP species conservation issues.

2) Evaluation of Future Candidate Translocation sites

Tuart Forest National Park (TFNP)

Pros –habitat known to support WRP, ground baited monthly for 20+ years

Cons – available habitat already occupied, high rates of predation, poor WRP survival rates

2000 ha located 15km north east of Busselton surrounded by cleared agricultural lands. The park is arranged in a linear orientation and comprised principally of tall tuart peppermint woodland with an absent to depauperate shrublayer over introduced grasses. Rainfall zone = 900mm

The perimeter of the park has been ground baited on a monthly basis over the last 20+ years. Despite this effort bait uptake remains high with the park likely to be functioning as a "predator sink or pit" from the surrounding agricultural lands. Operational solutions to reduce predator densities are not immediately obvious and the current bating program does not target cat control.

Because of its proximity to urban Busselton and perceived available habitat, the National Park has received many, possibly 100's of illegal WRP & BTP releases over the last 20+ years by wildlife rehabilitators and the general public. Jones (1994 ?) reported on 6 WRP released in Locke NR (10km W of Busselton CBD), an area known to support medium to high densities of WRP, no animals survived greater than a few weeks apparently unable to establish a territory/find unoccupied shelter sites and were subsequently predated.

Monitoring of resident WRP populations has been irregular and subject to funding constraints, though despite this the area has been subjected to a number of detailed post graduate possum investigations (WRP & BTP) .

Grimm et al (2009*) "Over the total period of the study, 50% (4/8) of the radio collared brushtails using the pine plantation only and 41% (7/17) of brushtail possums inhabiting both habitat types died or were lost from the monitored sample. Fox predation was implicated in every mortality event thought to be a result of predation and able to be attributed by DNA techniques, to a predator species (Table 1). There was no evidence to suggest that predation was as a result of land management practices and the high mortality rate was in spite of an existing fox baiting program.*"

Grimm (2010) *Survival of western ringtail possums in their natural habitat in the Busselton* region (Locke NR, Tuart Forest NP and Gelorup)
Survival of western ringtail possums is currently being studied at Ludlow Tuart Forest National Park (Mill and Bullock Blocks) and at Lakes Rd bushland near Gelorup (south of Bunbury). *Possums have been captured, health-screened, radio-collared and re-released at these sites in the months since January 2007. To date, 14 western ringtail possums have been captured at Ludlow and nine at Gelorup. Of these, eight have died, two have gone off the air and 13 remain alive. Seven of the eight deaths occurred during the summer months at Ludlow and the majority of these showed moderate to high levels of emaciation, indicating that nutritional conditions were poor at the time. Since the winter rains began fewer deaths have occurred. Predation appears to be less of a problem at these two sites than at the translocation sites; however, the duration of time that these animals have been on the air is shorter than that of many of the translocated animals."*

Table 2. Mean survival rates for western ringtail possums in the Busselton study sites. Mean days alive was calculated up to 18 June 07. (Animals whose collars have gone off the air are not included.)

Site	**N captured**	**N died**	**Mean days to death**	**Mean days since collaring for animals currently alive**
Ludlow	12	7	41	73
Gelorup	9	1	41	56

Conclusions – further releases of wrp within the TFNP are unlikely to be successful until predation rates can be substantially reduced, there is no strategic species conservation benefit by translocating wrp to the Tuart Forest National Park.

Forest areas south of Busselton

Pros – higher rainfall zone, thus presumably vegetation under less drought stress or for shorter duration than more inland sites.

Cons – habitat availability unknown- broadscale survey required, inadequate baiting regime – only air baited four times per year, suitable habitat likely to be occupied by WRP already albeit at low densities

Warren Region

Pros – higher rainfall zone

Cons – habitat availability unknown- broadscale survey required, inadequate baiting regime – only air baited

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References

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