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Acronyms

ABS          Australian Bureau of Statistics
CMA          Catchment Management Authority
CPI          Consumer Price Index
DPCD         Department of Planning and Community Development
DPI          Department of Primary Industries
DSE          Department of Sustainability and Environment
EVAO         Estimated value of agricultural output
GWRegion     Green wedge region
NRM          Natural resource management
PPW          Port Phillip and Westernport
RCS          Regional catchment strategy
SINL         (DPI’s) Services and Information to New Landholders project
UGB          Urban growth boundary

Acknowledgements

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Photographs on front cover feature Frank Smolders, a part-time farmer and furniture maker of Labertouche (top left), and Bindi Woodland (Landcare extension officer from the northern Yarra Landcare network) working with Roger Mason (full-time commercial grazier) on his property at Mickleham (bottom right).
Square pegs in green wedges?

Summary report

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1 Introduction

This summary report examines the social diversity of private rural land ownership in Melbourne’s ‘peri-urban’ hinterland, and explores strategies for improving these landholders’ natural resource management (NRM) on their rural properties (peri-urban land is rural and semi-rural land that is adjacent to and influenced by an urban centre). The full report (Parbery, Wilkinson & Karunaratne 2008) is the final product of the ‘Rural Land Use and Sustainable Green Wedges’ project, conducted by the Victorian Department of Primary Industries (DPI) for DPI and the Port Phillip and Westernport (PPW) Catchment Management Authority (CMA). The study arose from the recognition that more effective policies and relationships are urgently needed to improve natural resource management on private land in Melbourne’s rural hinterland.

For a range of reasons, the rural land surrounding Melbourne is highly valuable as rural land, and therefore in need of preservation and good management. Agriculture in the PPW region is highly productive (the highest per hectare in Victoria), with gross production in 2001 worth $890.9 million according to data from the Australian Bureau of Statistics (ABS). This is certainly an underestimate, and the real value may be closer to double this amount (Gardner 2002; Langworthy & Hackett 2000). It has been shown that ABS data routinely underestimates the value of agriculture in peri-urban areas, where many agricultural products attract prices higher that the national averages used to calculate ABS estimates (Houston 2005; Buxton et al. 2006). Melbourne’s rural hinterland is also economically important as a source of building materials such as stone and sand. In terms of biodiversity conservation, the region is the most ecologically diverse area of Victoria and contains many rare and endangered species (PPWCMA 2004). It is also highly valued for rural lifestyles, tourism and recreation.

1 Land prices are an especially important form of urban influence (Barr 2005; Buxton & Goodman 2002; Houston 2005).
As if the challenge of managing the region’s natural resources to meet such diverse (and often competing) objectives were not already sufficiently great, it is made more difficult and urgent by the serious deterioration in the condition of many of these natural resources. Commercial farming is becoming increasingly difficult due to the steady encroachment of incompatible land uses, among other reasons. Native biodiversity is in serious decline, with the region containing as much as 50% of all of Victoria’s threatened species (Buxton et al. 2006). Two of the most serious and persistent problems are the loss of native vegetation and the spread of established and new weeds (PPWCMA 2007a). These two issues are used as case studies in this report.

One of the principal pressures on rural natural resources is urban encroachment into formerly peri-urban areas, along with rising population densities and land use intensities on the remaining peri-urban land (Buxton et al. 2006). In 2001, the PPW region’s population was 3.4 million, including 133,000 people living in rural areas. The PPW region’s population is projected to grow by at least one million residents in coming decades, with recent (late 2007) analysis of population data indicating more rapid growth than had previously been projected.

In order to prevent uncontrolled urban development, the Victorian Government’s Melbourne 2030 policy (introduced in 2002 and reviewed in 2008) confined urban development to specified growth corridors, thereby protecting intervening rural areas (DOI 2002; AEG 2008). These rural areas—the green wedges—form an interrupted crescent surrounding Melbourne (Figure 1). The green wedges and growth areas are defined by an urban growth boundary (UGB) which cannot be altered without the consent of both houses of the Victorian Parliament. The objectives of the green wedges are to preserve rural land for agriculture, conservation, recreation, mineral extraction and special infrastructure entities (such as water treatment plants and airports) (DOI 2002), therefore planning restrictions within the green wedges prohibit the subdivision and development of rural properties. A recent review of the Melbourne 2030 strategy confirmed the value of the green wedges in helping to achieve these objectives (AEG 2008; Victorian Government 2008).

Within the green wedges, nearly 80% of rural land is privately owned, and so encouraging good management of rural land requires working closely with private landholders. Yet working with rural landholders in this region is more complex than in other part of the state, because of the extreme social diversity and dynamism of the peri-urban population. This report examines the social diversity of the green wedges, explores social characteristics which influence private rural landholders’ NRM behaviour, and develops a framework for selecting, tailoring and targeting appropriate NRM policy instruments to different social groups. It examines all rural land within the PPW region, with a particular focus on the green wedge areas.
2 Methods

This study combines information from a wide variety of sources, including published research, data on demographics and agriculture from the ABS, spatial data and novel empirical social research conducted in three green wedge areas. The empirical research focuses on just three green wedge areas to the west, the north-east, and the south-east of Melbourne. These three focus areas were defined according to the analytical needs of this study and termed ‘green wedge regions’ (GWRegions). Together these encompass and very closely approximate six official green wedges (see Figure 1).

The three focus areas of this study are:

- Western GWRegion comprised of the Werribee South, Western Plains South and Western Plains North green wedges
- Yarra GWRegion comprised of the Yarra Valley and Yarra and Dandenong Ranges green wedge; unless otherwise noted the term Yarra GWRegion refers to the ‘Inner’ Yarra GWRegion
- South East GWRegion comprised of the Southern Ranges and Westernport green wedges, and part of the (official) South East green wedge.

The empirical social research conducted in these three focus areas consisted of over 50 qualitative interviews with key groups (landholders, NRM service providers and sources within different agricultural sectors) within the study region, and a quantitative survey of 996 private rural landholders.

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2 In Figure 1 the boundaries of the 12 official green wedges are shown in purple (they are not named), while the GWRegions are indicated by blocks of colour and are named in the legend.

3 The ‘Outer’ Yarra GWRegion is largely unpopulated public land. Only the ‘Inner’ Yarra GWRegion was used—and the Outer Yarra region excluded—for demographic analysis, to enable meaningful comparisons of population density with other GWRegions. For analysis of agricultural data, it was deemed unnecessary to exclude the Outer Yarra GWRegion, and so data from both the Inner Yarra and Outer Yarra GWRegions was included.

4 The SE GWRegion does not include all of the official South East green wedge, as can be seen in Figure 1.
Figure 1. The six GWRegions and Melbourne’s 12 official green wedges
3 Findings

One key output of this research was a typology describing what appear to be some key kinds of landholders in the three focus GWRegions, from the point of view of their NRM practices. This typology is shown in Table 1 along with a quantitative breakdown derived from the telephone survey data. For this purpose, ‘lifestylers’ were defined as those with no or only hobby-scale farming activities. Farmers distinguished themselves as being ‘part-time’ or ‘commercial’, and those commercial farmers who indicated they ‘generally operate at a loss’ were defined as ‘struggling farmers’. ‘Green’ farmers and lifestylers are those who identified nature conservation as their most important reason for valuing their natural resources. ‘Amenity lifestylers’ are all those landholders who are not ‘green’ and do not have horses. Hybrid farmers are businesses which combine farm and non-farm operations, and ‘resident land speculators’ are those who do not plan to remain on their property and who favour urban development in their area.

Table 1 shows the relative abundance of these types of landholder across all of the three GWRegions studied ranked according to the area they occupy\(^5\). It is important to emphasise that the distinctions made in this typology are far from absolute, since many landholders plausibly fit multiple categories. Critically, these figures do not include absentee landholders, since these were largely not contactable for the purposes of the survey. As a consequence, these figures are likely to substantially underestimate the number of land speculators. This is especially true in the Western GWRegion, where it is estimated that around half of all rural land is owned by absentee landholders. Analogous data for each of the three individual GWRegions examined in this study is provided in their respective sections below.

The different types of landholders, such as those listed in Table 1, have distinctive motivations and capacities for managing their rural properties (Pannell et al. 2006; Crosthwaite et al. 2004; Hollier, Francis & Reid 2003). This study proposes that for best practice NRM to occur, landholders need to have three qualities: awareness, motivation and resources. Landholders’ motivations were explored in the greatest detail in this report, which identifies three principal components:

- landholders’ ‘attachment’ to their property (their emotional investment and willingness to invest time and money)
- the existence of any imperatives to manage the land in specific ways (for example as a home, farm or other business)
- ‘NRM values’ of the landholders.

The concept of NRM values denotes why (or whether) a landholder values the natural resources on their property — for example for agriculture (‘brown’ values), for nature conservation (‘green’ values), for natural beauty (‘aesthetic’ values), or perhaps not at all (‘zero’ values). Individual landholders hold different combinations of values. The telephone

\(^5\) Note that areas were estimated by multiplying the median property size for each category by the number of properties in that category.
survey explored which NRM values were most important for landholders, and found that brown values were highest overall (27%, dominating in the South East GWRegion), closely followed by aesthetic values (25%, dominating in the Yarra GWRegion) followed by green NRM values (17%, being especially prevalent in Yarra GWRegion).

Table 1. Typology of rural landholders with an approximation of their relative numbers and the area they occupy

<table>
<thead>
<tr>
<th>Landholder type</th>
<th>% by number*</th>
<th>% by area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial farmer</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Part-time farmer</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>Amenity lifestyler</td>
<td>24</td>
<td>16</td>
</tr>
<tr>
<td>Green lifestyler</td>
<td>21</td>
<td>14</td>
</tr>
<tr>
<td>Horse lifestyler</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>Hybrid farmer</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Struggling farmer</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Resident land speculator</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Green commercial farmer</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Non-farm business</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total in survey</strong></td>
<td><strong>996</strong> landholders</td>
<td><strong>Estimated 10,700 ha</strong></td>
</tr>
</tbody>
</table>

Note: Absentee landholders were not surveyed. Land owned by absentee landholders could approximate 20% to 30% of the land across the Western, Yarra and South East GWRegions

*Due to rounding of percentages to nearest whole number, this column totals 101%

†This area and the derived percentages-by-area were estimated using the median area for each landholder type across all three GWRegions. This method was used due to the skewed area distributions present for some types. Note that due to the use of median areas (rather than mean areas), the area of the three GWRegions calculated for this table does not equal the sum of areas from each of the three individual GWRegions, as shown in Sections 3.1 to 3.3. For details see the full report of this study.

The concepts described above are used in this report to explain landholders’ NRM activities, and to inform strategies for improving their NRM. Table 2 shows the NRM behaviour of different types of landholders in relation to two particular NRM issues; native vegetation and soil management. It is apparent that farmers and landholders with green NRM values have above average NRM activity, with the former focussed more on soil health, and the latter more on native vegetation. This illustrates the fact that, in addition to having different levels of NRM activity overall, different kinds of landholders engage in different kinds of NRM activities, in accordance with their particular reasons for owning and managing rural land. Note that although Table 2 appears to indicate, contrary to the qualitative evidence, that ‘struggling commercial farmers’ and ‘resident land speculators’ (two closely related categories) are both more active managers of native vegetation than ‘commercial farmers’, this is because graziers (who have more reason to fence) are under-represented in the ‘commercial farmer’ type and over-represented in the other two types.

As well as exploring landholders’ motivations and capacities for improved NRM, this report presents a framework which uses these insights to guide the strategic selection of NRM policy instruments, such as extension or incentives. For this purpose, the research adapts
Professor David Pannell’s framework for weighing the net public and private benefits of a specific NRM project (e.g. a revegetation scheme), modified in this study to accommodate different landholder motivations (Pannell 2006; Kaine et al. 2007). This approach has the potential to indicate which NRM policy instruments will be most effective in improving particular forms of NRM on private rural land in the green wedges and other rural areas of the PPW region.

The remainder of this summary examines the three focus GWRegions in greater detail, using the principles introduced above, before concluding with the report’s recommendations. Agricultural data for all six GWRegions can be found in the main report in Section 5.3.

Table 2. Some NRM activities of different types of rural landholders

<table>
<thead>
<tr>
<th>Landholder type</th>
<th>% who have planted or protected native vegetation</th>
<th>% who have managed soil health (e.g. salinity or erosion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amenity lifestyler</td>
<td>45</td>
<td>22</td>
</tr>
<tr>
<td>Horse lifestyler</td>
<td>54</td>
<td>28</td>
</tr>
<tr>
<td>Green lifestyler</td>
<td>66</td>
<td>29</td>
</tr>
<tr>
<td>Part-time farmer</td>
<td>59</td>
<td>45</td>
</tr>
<tr>
<td>Commercial farmer</td>
<td>39</td>
<td>42</td>
</tr>
<tr>
<td>Green commercial farmer</td>
<td>86</td>
<td>64</td>
</tr>
<tr>
<td>Struggling farmer</td>
<td>63</td>
<td>50</td>
</tr>
<tr>
<td>Hybrid farmer</td>
<td>75</td>
<td>48</td>
</tr>
<tr>
<td>Non-farm business</td>
<td>57</td>
<td>26</td>
</tr>
<tr>
<td>Resident land speculator</td>
<td>61</td>
<td>47</td>
</tr>
<tr>
<td>Average for all landholders</td>
<td>57</td>
<td>33</td>
</tr>
</tbody>
</table>

Note: Absentee landholders were not surveyed. Land owned by absentee landholders could approximate 20% to 30% of the land across the Western, Yarra and South East GWRegions

3.1 Western GWRegion

The Western GWRegion consists of the rural areas of the City of Wyndham and Shire of Melton, and combines three green wedges: Werribee South, Western Plains North and Western Plains South. It is part of the Western Plains Bioregion, characterised by its largely flat topography, rocky volcanic soils, rare and endangered grasslands and low rainfall (Gardner 2002). The low rainfall is a perennial problem for agriculture in the region, which sits under a ‘rain shadow’ and receives only 500 to 550 mm of rain annually, compared with 600 to 700 mm over other parts of Melbourne.

In 2001 the Western GWRegion contained 95,400 ha of rural land which was home to 6600 people. This population density (69 people per 1,000 ha) was 6.7% higher than it had been in 1986, but remained far below the average population densities for the three GWRegions studied (142 people per 1,000 ha). This low population density is due to the area’s smaller rural residential area (Figure 2), large property sizes and high number of absentee landholders. Absentee landholders account for as much as half of all rural land in the area. Though some absentee land is used by farmers and lifestyle residents, a substantial (but
unknown) proportion is unused, being owned principally as a speculative investment in the hope of future urban development. The telephone survey (which mostly reached landholders who live on their property, though a few respondents only worked there) indicated that even non-absentee landholders have high aspirations for development, with 46% indicating they would be pleased with urban development in their area (compared to an average of only 20% across all three GWRegions). As a consequence, the introduction of the green wedge zones in 2002 received an ambivalent—in many cases hostile—reception among the landholders and the two local councils of the region. Between 1986 and 2001, the Western GWRegion lost more rural land than any of the other six GWRegions, and its rate of population increase was third highest. Areas of major growth include Rockbank, Toolern Vale and Wyndham Vale (in the City of Wyndham), and Caroline Springs and Burnside (in the Shire of Melton).

The land use data (Figure 2) also shows that the Western GWRegion has relatively little land used for nature conservation, with most land being used for grazing and other forms of agriculture. Most of this agricultural activity is marginal. The typology produced from the telephone survey (Table 3) indicated that over half of the area surveyed was owned by commercially-oriented farmers who generally operate at a loss (‘struggling farmers’; mostly cropping and grazing on large properties). ABS data indicates that grazing in this region produced only $96/ha in 2001, in comparison to $13,000/ha for vegetable growing, 75% of which is concentrated in a small area at Werribee South (see Figure 2).

Table 3. Rural landholders in the Western GWRegion according to telephone survey data (not including absentee landholders)

<table>
<thead>
<tr>
<th>Type of landholder</th>
<th>% of all landholders*</th>
<th>% of total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Struggling farmer</td>
<td>4</td>
<td>53</td>
</tr>
<tr>
<td>Amenity lifestyler</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>Horse lifestyler</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Part-time farmer</td>
<td>11</td>
<td>7</td>
</tr>
<tr>
<td>Green lifestyler</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>Hybrid farmer</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Resident land speculator</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Commercial farmer</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Non-farm business</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Green commercial farmer</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total in survey</td>
<td>140 landholders</td>
<td>estimated 2,940 ha</td>
</tr>
</tbody>
</table>

Note: Absentee land not included in this survey could approximate 50% of the Western GWRegion

*Due to rounding of percentages to nearest whole number, this column totals 101%

ABS data also indicates that vegetable growing in 2001 accounted for over half of the total number of farms and 75% of the value of production of agriculture in the Western GWRegion (Figure 3), highlighting the importance of irrigation water (and Werribee’s rich soils) for agriculture in this low-rainfall region. Overall, agriculture in the Western GWRegion is much less diverse and much less productive than in the other two GWRegions, with 225 farms producing $63.4 million gross in 2001. This is only 7% of the total value of production for the PPW region, compared to 21% produced by the Yarra GWRegion and 27% from the South
East GWRegion. Taking into account the difference in their size, this suggests that the Western GWRegion is around 2.4 times less productive than the South East GWRegion. The only agricultural sector whose value of production increased more than CPI inflation between 1986 and 2001 was viticulture (vegetable and intensive animal production both came close).

The major NRM issues in the Western GWRegion are the rapid loss of rare and endangered native vegetation, the spread of weeds and animal pests (especially rabbits), water quality and erosion (particularly along waterways) (PPWCMA 2007b). Large areas of the Western GWRegion are subject to serious weed infestations, particularly serrated tussock. Loss of native vegetation may be exacerbated by landholders’ development aspirations—this research has uncovered claims that some landholders destroy protected native grasses in the hope that this will increase their chances for subdivision and development of their property. Threatened species in the area include the matted flax lily, the earless dragon and the golden sun moth.

Improved NRM in the Western GWRegion would appear to require more positive engagement between NRM agencies, councils and landholders, and would depend on the creation of a mutually acceptable vision for the future of the area. Part of this vision could include commercial agriculture in areas where it has a reasonable chance of remaining (or being made) viable, for example through the development of improved water infrastructure and planning protection*. In areas where commercial agriculture cannot become viable, encouraging lifestyle farming may result in better NRM outcomes than the land speculation which currently prevails. Overall, developing a future vision for green wedges in this problematic area would appear to require deeper re-engagement and renegotiation with both councils and individual landholders to address entrenched expectations for urban development. Innovative policies may enable endangered grasslands to be protected as an integral component of other rural land uses, though in some cases stronger measures may be required, such as the acquisition of key properties by government.

* It is important to note that the commercial viability of particular agricultural sectors in particular areas depends on many factors besides those examined in this study, including the market price of key inputs and outputs.
Figure 2. Land use in the Western GWRegion in 2004.
3.2 Yarra GWRegion

The Yarra GWRegion covers the western half of the Shire of Yarra Ranges (i.e. excluding the ‘Outer’ region shown in Figure 1) and also incorporates small parts of the Shire of Cardinia, and the Cities of Knox and Maroondah. It is part of the Yarra Valley and Dandenong Ranges Bioregion (Gardner 2002), characterised by hills, extensive forest cover and high rainfall (around 1,000 mm annually). The Yarra GWRegion includes a substantial amount of public land which is used for conservation, recreation, logging and as a water catchment area. The major rural industries are tourism and agriculture.

In 2001 the Yarra GWRegion contained 113,140 ha of rural land, which was home to 16,770 people, most of whom live in a limited area used for rural residency (Figure 4). Its population density of 147 people per 1,000 ha was fairly high compared to the other six GWRegions, but also declined by nearly 1% between 1986 and 2001 (perhaps due to decreasing household size, especially among retirees). Properties in this area are generally much smaller than in the Western GWRegion, and absentee landholders are less common (though no firm figures are available). The proportion of rural land lost between 1986 and 2001 was half that of the Western GWRegion (4.4% compared to 9.8%), and resident landholders are generally opposed to further urban development (only 11.4% would be pleased with development whilst 72.2% would be disappointed). The Shire of Yarra Ranges has been broadly supportive of the introduction of the green wedge zones under the Melbourne 2030 strategy (DOI 2002), because the objectives of the green wedges largely accord with plans and aspirations already developed for these areas. Although development in the area is currently limited, the region is already interspersed with numerous small urban centres (Figure 4).
The telephone survey indicated that the Yarra GWRegion is dominated by different kinds of lifestyle landholders (50% of the area, see Table 4), including the highest proportion anywhere of green lifestylers (20% by area) and horse lifestylers. Unlike the Western GWRegion, the Yarra GWRegion has substantial and diverse commercial agriculture (that is commercially-oriented farmers who are not operating at a loss, i.e. ‘commercial’ and ‘green commercial’ farmers in Table 4), though the area it occupies is much less than in the South East GWRegion (4% in the Western, 12% in the Yarra and 37% in the South East GWRegions). In 2001 agriculture in the Yarra GWRegion generated $187.5 million gross from 578 farms.

Table 4. Rural landholders in the Yarra GWRegion according to telephone survey data (not including absentee landholders)

<table>
<thead>
<tr>
<th>Type of landholder</th>
<th>% of all landholders</th>
<th>% of total area¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green lifestyler</td>
<td>23</td>
<td>20</td>
</tr>
<tr>
<td>Part-time farmer</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>Amenity farmer</td>
<td>24</td>
<td>19</td>
</tr>
<tr>
<td>Horse lifestyler</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>Hybrid farmer</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Commercial farmer</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Non-farm business</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Green commercial farmer</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Struggling farmer</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Resident land speculator</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>385 landholders</td>
<td>estimated 3,275 ha</td>
</tr>
</tbody>
</table>

Note: Absentee land not included in this survey could approximate 15% of the Yarra GWRegion

¹Due to rounding of percentages to nearest whole number, this column totals 102%

As well as being more productive (Figure 5), agriculture is also much more diverse than in the Western GWRegion, with major contributors including viticulture, nurseries, fruit (especially berry fruits such as strawberries), vegetables and intensive animal production (Langworthy & Hackett 2000). In contrast to the Western GWRegion, all these industries increased their gross value of production ahead of inflation between 1986 and 2001.

In the telephone survey, 13% of commercial farmers indicated they were highly profitable compared to only 5% in the South East GWRegion and 0% in the Western GWRegion. Nonetheless both the numbers and the area of farms declined in these five farm sectors (generally by around 50%), with the exception of viticulture (which grew astronomically) and nurseries (which grew modestly). As in all parts of the PPW area, grazing is a major (and largely non-commercial) land use, though there is substantially less grazing in the Yarra GWRegion than in the other two GWRegions, and this experienced a further 50% reduction in farm numbers and total area between 1986 and 2001.
Figure 4. Land use in the Yarra GWRegion in 2004
The natural resources of the Yarra GWRegion are generally in good condition, though there are NRM issues in need of attention (PPWCMA 2007b). These include pest plants and animals, erosion, nutrient management and other water quality issues. While there are substantial areas of protected native habitat, there are also endangered species such as the helmeted honeyeater, Leadbeater's possum and some eucalyptus species.

Overall, established long-term plans for the Yarra GWRegion appear to already be largely consistent with the *Melbourne 2030* (DOI 2002) green wedge zones and with NRM objectives. The current mixture of intensive and ‘hybrid’ (e.g. combined with tourism) commercial agriculture and lifestyle living does present substantial challenges for coexistence, and so the ongoing success of the area will depend on active management of the mutual expectations and impacts of commercial and lifestyle landholders. Synergies between these activities (e.g. agriculture, tourism and nature conservation) are conducive to good NRM and should continue to be actively developed (see Langworthy, Howard & Mawson 2006; Knowd 2006).

![Figure 5. Agriculture in the Yarra GWRegion](image)

### 3.3 South East GWRegion

Most of the South East GWRegion is made up of the rural areas of the City of Casey and of the Shire of Cardinia, much of which is outside of the UGB. It is mostly coextensive with the Southern Ranges and the Westernport green wedges, but also takes in part of the Yarra Valley and Yarra and Dandenong Ranges green wedge. It is bordered by the foothills of the Dandenong Ranges in the north and by Westernport Bay in the south. It is divided, between north and south, by the South Eastern growth corridor, with rapid development occurring along the Princes Freeway dividing the two green wedges which make up the South East GWRegion. The hilly and often forested areas to the north are part of the Yarra Valley and
Dandenong Ranges Bioregion (Gardner 2002). To the south, the landscape is generally flat and more open, forming part of the coastal Mornington Peninsula and Westernport Bioregion. Much of the southern area was once swamp and remains susceptible to flooding and waterlogging. It drains into the internationally recognised (Ramsar) wetlands of Westernport Bay. The area has good rainfall (around 800 mm annually), though not as high as the Yarra GWRegion.

In 2001 the South East GWRegion was the largest GWRegion (150,660 ha of rural land) and was home to the most people (23,880). Its population density was the third highest in 2001, though it experienced a decline from 1986 to 2001 of 2.6%, possibly due to decreasing household size (as farmers age and retirees move to the area). However this population decline does not include substantial population increases in newly urban areas. Though the South East GWRegion lost only 4% of its rural land between 1986 and 2001 (compared to an average of 5.7% across all six GWRegions), the City of Casey is now a key area for urban expansion, with vigorous new development around Cranbourne, Narre Warren and Berwick amongst other locations. The telephone survey indicated that rural landholders in the South East GWRegion are more likely to be pleased by urban development (20.8%) than in the Yarra GWRegion (11.4%), although the majority would be disappointed at the prospect of urban development (60.5%)—unlike in the Western GWRegion.

Land use data for the South East GWRegion shows that agriculture is concentrated in the south, with rural residential areas and public land mostly confined to the north (Figure 6). Intensive agricultural activities are less spatially concentrated than in the Western GWRegion, creating more challenges from ‘right-to-farm’ issues arising between farming and non-farming neighbours (Hider 2002; Pickersgill 2004). The telephone survey data (Table 5) illustrates the importance of commercial agriculture in the region: commercial farmers (including ‘green’ farmers) account for 37% of the area surveyed and other types of farms (including ‘hybrids’) account for a further 27%. Farm profitability in the region is intermediate between that of the Yarra and the Western GWRegions, with 5.3% of commercial farmers indicating they were highly profitable, and 23% indicating they generally operate at a loss (i.e. a ‘struggling farmer’, compared to 32% in the Western and 19% in the Yarra GWRegions).

Agriculture in the South East GWRegion is less diverse than in Yarra GWRegion but includes greater amounts of extensive agriculture, such as dairy and beef grazing. Unlike the Western GWRegion, a substantial proportion of this extensive agriculture is commercially successful. Dairying, vegetable growing and intensive animal production collectively accounted for nearly 80% of the total gross value of production for the South East GWRegion in 2001—$241 million or 27% of the total for PPW area (see Figure 7). Despite the region’s agricultural strengths—which stem from its generally good soils, rainfall and flat terrain—the only farm sectors whose gross value of production increased ahead of inflation were nurseries, viticulture and fruit growing.
Table 5. Rural landholders in the South East GWRegion (not including absentee landholders)

<table>
<thead>
<tr>
<th>Type of landholder</th>
<th>% of all landholders*</th>
<th>% of total area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial farmer</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Part time farmer</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Amenity lifestyler</td>
<td>23</td>
<td>12</td>
</tr>
<tr>
<td>Green lifestyler</td>
<td>21</td>
<td>11</td>
</tr>
<tr>
<td>Green commercial farmer</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Struggling commercial farmer</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Horse lifestyler</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Resident land speculator</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Hybrid farmer</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Non-farm business</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>471 landholders</strong></td>
<td><strong>estimated 6,386 ha</strong></td>
</tr>
</tbody>
</table>

Note: Absentee land not included in this survey could approximate 20% of the South East GWRegion
*Due to rounding of percentages to nearest whole number, this column totals 101%

Overall, the total area of agricultural land declined by 18% between 1986 and 2001 according to ABS data, reflecting urban development occurring along the region’s growth corridor (including a substantial expansion of the UGB in late 2005), and ongoing gentrification.

This region is affected by a number of NRM issues, some of which are quite serious. The literal root of many of these problems lies in the extensive loss of vegetation from the region, initially for agriculture and later for urban development (PPWCMA 2007b; Tilling 2006). The inherent loss of biodiversity and habitat has also led to other problems such as salinity. There is substantial erosion, particularly in the Southern Ranges green wedge whose streams flow into Westernport Bay where sedimentation is destroying ecologically and economically important sea grasses (important as fish nurseries). Other problems include eutrophication of water, weeds and animal pests (especially foxes, rabbits and domestic cats). The area is also home to the growling grass frog and the brown banded bandicoot.

The future prospects for the northern areas of the South East GWRegion (the Southern Ranges green wedge) appear to be more similar to the Yarra Valley and Yarra and Dandenong Ranges green wedge than to the Westernport green wedge. In the southern areas of the South East GWRegion (the Westernport green wedge) the long-term vision for rural land could potentially feature commercial agriculture as a central focus, and include the protection of land suitable for horticulture and dairying. This would need to be combined with additional programs aimed at improving NRM (particularly conservation-oriented NRM) if such problems in the region are to be addressed. It is in this area that a stable UGB can make the greatest contribution to assisting agriculture to remain commercially viable, also aided by the management of ‘right-to-farm’ conflicts. The South East GWRegion also has substantial potential for further ‘hybrid’ activities combining agriculture with its input and output industries, tourism, hospitality, recreation and nature conservation.
Figure 6. Land use in the South East GWRegion in 2004
Figure 7. Agriculture in the South East GWRegion

4 Recommendations

The remainder of this section summarises the key recommendations from the study, aimed at helping to improve NRM on private rural land in the green wedges and other rural areas of the PPW region. It also identifies issues which have an indirect bearing on NRM, for example, through the successful implementation of Green Wedge Management Plans in the green wedge areas. Such success (i.e. the formulation and implementation of an appropriate green wedge vision which attracts support or cooperation from landholders, local governments and other stakeholders) can make a strong contribution to improving NRM, in the first instance by protecting rural land from urban development, and then by encouraging land uses which are both appealing to landholders and conducive to good NRM.

It must be noted that these recommendations are made specifically with a view to improving NRM. Implementation would need to take into account other relevant policy objectives, such as housing affordability, the development of key infrastructure and access to building materials such as stone and sand. Similarly, it is important to note that different policy imperatives—such as managing natural resources or facilitating structural adjustment in agriculture—can imply different roles for planning as a policy instrument. The Victorian Government’s recent ‘Future Farming’ statement announced the establishment of a Regional Strategic Planning Expert Group to examine issues relating to land use planning and structural adjustment (DPI 2008: Action 4.4). The recommendations involving planning presented below therefore need to be interpreted in the light of ongoing developments in this area.
These recommendations are made by the report authors on the basis of the research conducted in this study, and in the knowledge that not all relevant stakeholders could be included in this research. The authors therefore offer the recommendations as ideas for further discussion among all relevant stakeholders. The recommendations do not necessarily reflect the views of DPI or the PPWCMA.

The recommendations are grouped according to their overarching objective or strategy. Each is addressed to the most relevant stakeholders (‘audience’), and directs the reader to supporting evidence and detail in the body of the full report (‘basis’). Part of the basis for certain recommendations consists of unpublished findings from this study.

4.1 Improve NRM by strategically targeting particular kinds of landholders and NRM issues

This research suggests that the management of different kinds of NRM issues may require working with different kinds of landholders. It also confirmed that different kinds of landholders are likely to respond best to different kinds of policy instruments designed to improve their NRM behaviour. A strategic approach to improving NRM therefore requires that government agencies identify who best to target and how best to target them, for particular NRM issues. The following specific recommendations are pertinent:

- Use the landholder classifications in this report to identify the likely aspirations, capabilities and management priorities of the landholders that need to be engaged in protecting environmental assets.
  
  Audience: NRM policy makers and extension officers in the PPWCMA, DPI, DSE, local government and elsewhere.
  
  Basis: Chapters 3 and 4

- Use the modified form of Pannell’s framework (presented in the full report of this study) to help select the mix of policies instruments most likely to be effective in influencing the landholders relevant to a particular NRM project. Also use other social insights presented in this report to tailor and target such policy instruments.
  
  Audience: NRM policy makers and extension workers in DPI, DSE and PPWCMA.
  
  Basis: Chapter 7

- To identify the landholders that need to be engaged in order to solve particular NRM problems, systematically identify the kinds of landholders who manage key natural assets (and generated threats to assets) in particular areas. Use this information—along with the landholder categories presented in this report—to help identify who best to target for improved NRM.
  
  Audience: NRM policy makers and extension officers in the PPWCMA, DPI, DSE, local government and elsewhere.
  
  Basis: Chapters 3 and 4
• Prioritise working with landholders who have large properties (e.g. commercially-oriented graziers), in order to minimise the ‘transaction cost’ of engaging many small landholders. However, it may be important to engage landholders with small properties in areas where NRM issues with ‘off-site’ impacts are especially important, or are being targeted. Off-site NRM impacts is an issue in which even small properties can have strong effects on neighbouring properties (e.g. as weed reservoirs) or other areas within a catchment (e.g. water pollution from intensive uses).

Audience: NRM policy makers and extension officers in the PPWCMA, DPI and elsewhere.

Basis: Chapter 3 and Section 7.4

• Where commercial agriculture is identified as an NRM priority, use established industry and social networks to promote projects that assist farmers to minimise their impacts on natural resources, while maintaining or improving their commercial viability. Such assistance should not be financial, but could take the form of appropriate planning, management of community expectations, the creation (or facilitation) of critical infrastructure (for example water and transportation), the provision of information and training, and the creation of new income sources (e.g. ecosystem services: see below). These initiatives could be considered in the development of Green Wedge Management Plans.

Audience: DPI, DPCD and local councils

Basis: Chapter 5

• Develop strategies for engaging with lifestyle landholders: especially in ways that respond to their particular aspirations and management capabilities. This could include the further development of DPI’s ‘Services and Information for New Landholders’ (SINL) project. Within the PPW region, SINL currently operates principally in the Yarra GWRegion. In particular, take advantage of opportunities for improved engagement with horse lifestylers.

Audience: Extension workers and policy makers within DPI, PPWCMA and local councils.

Basis: Chapter 4, especially Section 4.3.3 (‘Recreation NRM values’) and Section 7.6. Also unpublished landholder interviews.

• Conduct further research to develop better strategies for engaging absentee landholders, including corporate, professional and family absentee landholders. The research in this project did not succeed in contacting this important group of landholders, who account for up to 50% of all rural land in some areas.

Audience: DPI, PPWCMA or DPCD’s Green Wedge Team.

Basis: Sections 4.3, 6.1 and 7.7
4.2 Engage absentee landholders and address land speculation

The qualitative research in this study suggests that the worst NRM managers are those with very low attachment to their rural properties, specifically absentee land speculators (these landholders were not contactable during the quantitative research). It seems a productive strategy for improving NRM practices may therefore be to cultivate increased attachment among existing landholders, or encourage the displacement of low-attachment absentee speculators with resident landholders with higher attachment. Specific recommendations include:

- Limit land speculation over the long term by consistently not altering the UGB, especially outside of designated potential growth areas. The effectiveness of the UGB in discouraging land speculation depends entirely on landholder perceptions of its stability. For some landholders even demonstrated bipartisan political support for the existing UGB will not be convincing. Such landholders may only be convinced by witnessing the stability of the UGB despite changes in government.
  
  Audience: DPCD
  
  Basis: Section 4.3.3 (‘Developer NRM values’)  

- Limit land speculation by researching and engaging with the real estate and urban development industries and local councils, to influence the expectations which some hold and cultivate in landholders for development in the green wedges. Develop and conduct sophisticated and long-term communication and community education programs about the value of green wedges and the government’s commitment to retaining them. Especially aim to dampen speculation that the UGB will be moved and more green wedge land will be made available for development.
  
  Audience: DPCD
  
  Basis: Section 4.3.3 (‘Developer NRM values’)  

- Improve non-absentee landholders’ attachment to land by facilitating appropriate land uses such as agriculture and other rural businesses and, in some instances, rural residency. Recommendations for improving the viability of commercial farming can be found in the next section. Where commercial agriculture is no longer viable and cannot be made so, it may be preferable to encourage lifestyle farming (without subdivision below 40 ha) rather than have land managed by struggling commercial farmers whose principal interest has become subdivision and urban development. As a land use, lifestyle farming is certainly more conducive to good NRM than absentee land speculation.
  
  Audience: DPCD and strategic planners in local government.
  
  Basis: Sections 4.3 and 6.1
• If limited changes to the UGB (and attendant development) become unavoidable, confining such change to pre-designated areas of potential growth, and making the basis of such changes transparent and well-principled, will limit the extent to which they fuel land speculation. Government could investigate mechanisms for containing the land speculation caused by development, such as using capital gains from urban development to fund one-off payments to adjoining rural landholders, in exchange for them adopting legal covenants which permanently extinguish any possibility of development on the property.

Audience: DPCD, local government
Basis: Sections 4.3.3 (‘Developer NRM values’)

4.3 Assist agriculture to remain commercially viable (without financial payments)

As a land use, commercial peri-urban agriculture can make important contributions to NRM, to the protection of rural land from urban encroachment, and to other objectives of the Melbourne 2030 (DOI 2002) green wedge zones (along with its substantial economic contribution to the State of Victoria). There are opportunities for government to assist peri-urban commercial agriculture (in non-financial ways) to remain viable, thereby helping these benefits to be realised.

• Identify and protect quality agricultural land from urban encroachment and ‘right-to-farm’ issues. This could involve new buffer zones between commercial agriculture and lifestyle living in key areas, and the modification of new landholder expectations (for example, in Section 32 of the vendor statement). Conversely, it may be appropriate to identify and protect quality amenity areas from being compromised by inappropriate agricultural intensification using similar measures.

Audience: Strategic planners in local government
Basis: Section 4.3.3 (‘Aesthetic NRM values’) and Section 5.1

• Identify and invest in critical infrastructure such as water and transportation as part of the development and implementation of Green Wedge Management Plans, in areas where such infrastructure would help commercial agriculture to remain viable.

Audience: DPCD’s Green Wedge Team, Department of Transport.
Basis: Ransom and Parbery (2007)

• Consider clustering socially sensitive intensive agriculture which does not require a particular soil or climate (such as broiler farms) in low amenity areas near appropriate infrastructure. These essentially become commercial semi-urban areas.

Audience: Strategic planners in local government
Basis: Section 4.3.3 (‘Aesthetic NRM values’), Section 5.4.1 (‘Fragmentation in the PPW region’)
Develop resources to assist agricultural operators to take advantage of opportunities for value-adding in the region through niche- and direct-marketing (farmers markets, organic production, ‘provenance’-based branding, eco-labelling), the provision of accredited ecosystem services (coherently branded and promoted if combined with niche-marketing), and business hybridisation with tourism, recreation and hospitality. 
Audience: Local government 
Basis: Section 5.1

4.4 Develop new tools for NRM

Due to the particular challenges and opportunities for NRM which arise in peri-urban areas (such as the social diversity of landholders, and the high incidence of absenteeism) it would appear possible—and necessary—to develop new or modified policy instruments aimed at improving NRM on private land in these areas. Specific possibilities include:

• Develop strategies for achieving NRM on land held by landholders with low time or interest in NRM (absentee landholders for example), and encourage private industry to service this market. Subject to legal constraints, this could include greater use of NRM contractors to make NRM easier (though not necessarily cheaper), or to make compulsion easier (with costs recovered through courts). 
Audience: Extension workers and policy makers in DPI and local government. 
Basis: Section 7.7

• Explore potential for semi-commercial farmers to provide contract NRM and land and stock management services to lifestyle landholders as a means of improving NRM on lifestyle landholders’ properties, while simultaneously providing an additional income stream for farmers and thereby helping them to remain viable. 
Audience: Local government 
Basis: Section 5.1 (‘Hybridisation’)

• Urgently develop more effective approaches to preventing native vegetation loss in the Western GWRegion. This should include better monitoring and more effective disincentives to clearing. It may also require a different approach to prohibitions on clearing for land development and renewed engagement with councils over future land use (as discussed above). Develop a market-based positive incentive scheme for native vegetation and other ecosystem services, such as the EcoTender demonstration proposed for the PPW region for 2009-2010. This could take advantage of the region’s extreme variation both in attitudes to native vegetation (and other ecosystem services) and in the production value of agricultural land. 
Audience: DPI, DSE 
Basis: Section 4.3.3 (‘Developer NRM values’), Sections 6.1 and 7.4.
4.5 Make the green wedges work

The green wedge zones, as conceived in *Melbourne 2030* (DOI 2002), have the potential to make positive contributions to NRM in Melbourne’s rural hinterland. Sufficient attention to the implementation of the green wedge vision—using the Green Wedge Management Plans—will help ensure that these benefits are realised, and that any potential difficulties are minimised.

- Make long-term investments in infrastructure, events and marketing which contribute to the strategic ‘vision’ of particular green wedges. This should include water and transportation infrastructure for agriculture, and other investments which support key tourism, recreation, hospitality and other industries.

Audience: DPCD’s Green Wedges Team and local government.
Basis: Section 5.1, Ransom and Parbery (2007)

5 Conclusion

The report’s title—‘Square pegs in green wedges?’—refers to the fact that there is a ‘poor fit’ between some landholders’ aspirations and capacities for land use and the objectives of the *Melbourne 2030* (DOI 2002) green wedge zones, including good NRM. Although these landholders are only a minority of the landholders in the green wedges, their poor fit constitutes the single greatest threat to the stability of the green wedges. The implication is that successful implementation of Green Wedge Management Plans (and thereby of good NRM) cannot be achieved in such cases without some alterations to the landholders’ aspirations and capacities, or to the green wedge policy. For example land speculation is directly at odds with green wedge policy, yet some argue that the land uses permitted by green wedge policy are simply unviable in some areas (such as commercial agriculture in many areas of the Western GWRegion). Conversely, the green wedge policy discourages land uses that in some areas (and only some) may provide the best means of achieving most of this policy’s objectives, such as lifestyle farming where commercial farming is unviable (which can encourage greater landholder attachment to land, and therefore more investment in NRM). A further irony is that some of the strongest opposition to (as well as some support for) the green wedge policy of preventing subdivision comes from commercial farmers—some of the landholders that the green wedge policy is designed specifically to assist by protecting rural land for agriculture. In summary, although the green wedge policy is well suited to (and welcomed in) most of the areas studied, there are some areas where achieving a good fit between ‘peg’ and ‘wedge’—or people and policy—may require some reshaping of both.
References


