

1 Purchase, protect, resell, repeat: An effective process for 2 conserving biodiversity on private land?

3 Hardy, Mathew J.^{1,2} mat.hardy@rmit.edu.au

4 Fitzsimons, James A.^{3,4} jfitzsimons@tnc.org

5 Bekessy, Sarah A.^{1,2} sarah.bekessy@rmit.edu.au

6 Gordon, Ascelin.^{1,2} ascelin.gordon@rmit.edu.au

7 ¹ School of Global, Urban and Social Studies, RMIT University, GPO Box 2476, Melbourne,
8 Victoria 3001, Australia

9 ² ARC Centre of Excellence for Environmental Decisions, RMIT University, Melbourne, Victoria, Australia

10 ³ The Nature Conservancy, PO Box 57, Carlton South, Victoria 3053, Australia

11 ⁴ School of Life and Environmental Sciences, Deakin University, 221 Burwood Highway, Burwood, Victoria
12 3125, Australia

13 Corresponding author: Mathew J. Hardy, School of Global, Urban and Social Studies, RMIT University, GPO
14 Box 2476, Melbourne, VIC, 3001, Australia. Phone: +61 3 9925 8207, Fax: +61 3 9925 3088, email:
15 mat.hardy@rmit.edu.au

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17 **In a nutshell**

- 18 • Purchase-protect-resale (PPR) programs, such as revolving funds, allow conservation organizations to
19 purchase private land with conservation value and resell it with a protective agreement, enabling cost
20 recovery
- 21 • Globally, more than US\$384m is available in PPR funds, with over 684,000 hectares protected to date
- 22 • PPR programs can potentially be financially self-sustaining
- 23 • The implementation of PPR can be complex and uncertain, and subject to the market for conservation
24 properties
- 25 • Identifying property types that can meet conservation objectives and recover costs within a reasonable
26 timeframe, and drawing insights from economics to assist decision-making, could increase the
27 effectiveness of PPR and improve conservation outcomes.

28 **Abstract**

29 Global conservation efforts are increasingly focused on expanding the amount of private land permanently
30 protected for biodiversity. These efforts are often constrained by financial resources, particularly where
31 land acquisition is expensive, or where landowners are reluctant to enter into conservation agreements.

32 Purchase-protect-resale (PPR) programs are used by conservation organizations in a number of countries to
33 facilitate the purchase, resale and protection of private land. For the first time, we systematically review
34 the literature on PPR and collate information on its use around the world. We find more than US\$384m
35 available in PPR funds, and over 684,000 hectares protected to date. We identify unique attributes of this
36 approach, the challenges of its implementation, and discuss its potential for protecting land unsuitable for
37 other conservation approaches. Our analysis highlights the importance of selecting appropriate properties
38 and we argue that insights from the economics literature could help increase the effectiveness of PPR
39 programs.

40 **Introduction**

41 The protection of private land is an important part of global efforts to conserve biodiversity. Whilst short-
42 term and non-binding mechanisms exist for conserving private land (Mayer and Tikka 2006; Santangeli *et*
43 *al.* 2016), permanent protection mechanisms are often preferable land due to the heightened certainty
44 that ecological values will remain protected into the future. In addition, many permanent protection
45 mechanisms enable the establishment of Privately Protected Areas (PPAs) – protected areas ‘under private
46 governance’ – which are seen as increasingly important instruments for achieving the Convention on
47 Biological Diversity Aichi Target for ecologically representative protected area networks (Stolton *et al.*
48 2014).

49 Two dominant approaches currently exist for creating PPAs and permanently protecting biodiversity on
50 private land. Perhaps the most prominent is the outright purchase of land with conservation value and its
51 ongoing management for biodiversity (‘acquisition’). The acquisition approach allows conservation
52 organizations to strategically purchase land of high conservation value and manage it over time, an
53 approach that may be particularly effective for conserving biodiversity where development pressures are
54 high and land supply is tightly constrained (Armsworth and Sanchirico 2008). However, acquiring land can
55 be expensive, especially in landscapes with competing land uses and high land values (eg peri-urban areas)
56 (Newburn *et al.* 2005), and funding for long-term management can be difficult to obtain (Pasquini *et al.*
57 2011). Whilst important for conservation, the acquisition approach on its own is unlikely a viable solution to
58 conserving biodiversity on private land on large scales (Fairfax *et al.* 2005).

59 The second dominant approach for creating PPAs is for conservation organizations to establish permanent
60 agreements with landowners, such as conservation covenants and easements (Fishburn *et al.* 2009;
61 Fitzsimons 2015). These agreements are voluntary for landowners, but legally bind current and future
62 owners to either active management or restricted use of their land to conserve biodiversity (Fitzsimons and
63 Carr 2014), and are used by organizations in a growing number of countries, including Australia, Canada,
64 New Zealand, and the United States (Ewing 2008; Fishburn *et al.* 2009; Fitzsimons 2015; TNC 2016). They
65 offer an enduring approach to protection (Hardy *et al.* 2017) that reduces development pressures on

66 biodiversity (Pocewicz *et al.* 2011), whilst proving less costly to conservation organizations than land
67 acquisition and ongoing management (Parker 2004; Comerford 2013) and avoiding the social disruption of
68 large-scale land acquisitions (see Mansergh *et al.* 2008). However, implementation of permanent
69 agreements relies on landowners volunteering their property for protection, limiting their application to a
70 subset of landowners (Comerford 2013), and sometimes requiring the use of financial incentives to
71 encourage uptake (Rissman *et al.* 2013). Each new permanent agreement also requires conservation
72 organizations to take on long-term costs (Figgis *et al.* 2005) such as administration, monitoring and
73 compliance, and enforcement (Rissman *et al.* 2013), and in some cases the provision of ongoing
74 stewardship support to landowners (Adams *et al.* 2012). Where the agreement is difficult for the
75 organization to establish, monitor, or enforce, these costs may make acquisition a preferable approach
76 (Parker 2002), provided the property is available for purchase.

77 **Conservation using purchase-protect-resale**

78 An alternative to outright purchase of land is for conservation organizations to acquire private land and
79 then sell it on to new, conservation-minded owners, in the process adding an in-perpetuity conservation
80 covenant or easement to protect the lands conservation values. The approach is broad and not well-
81 defined (we refer to it here as purchase-protect-resale or PPR), and is currently achieved by organizations
82 through several means. One is to use a dedicated fund (a “revolving fund”) to purchase private land with
83 conservation value, and then resell the land to new owners with a permanent conservation agreement
84 added to the property title (Fitzsimons and Wescott 2001; Hardy *et al.* 2018). Fund capital is replenished
85 mostly through reselling the purchased properties (Fig 1), ideally recovering all purchase, transaction and
86 ongoing costs (Brewer 2003; Cowell and Williams 2006), with replacement capital raised if required. The
87 replenished capital is then used to purchase and protect additional properties (Safstrom 1996). A second
88 and similar approach is to use a “revolving loan fund”, whereby fund capital is distributed for this purpose
89 either within a conservation organization (an “internal” revolving fund) or to a separate organization or
90 individual (an “external” revolving fund), with an agreement for the borrower to return the money (often
91 with low or zero interest) within a given time frame (McBryde *et al.* 2005; see Clark 2007). A third approach
92 is to buy and resell land using part of a large capital fund (e.g. an endowment fund) that is not marked
93 exclusively for the PPR approach and may be used for other conservation activities or expenses.

94 The PPR approach is closely related to ‘conservation buyer’ programs (Land Trust Alliance 2008) (where the
95 conservation organization acts as a broker linking the seller and purchaser), except in the PPR approach the
96 conservation organization takes interim ownership of the property. PPR is also similar to ‘pre-acquisition’
97 (Hunter and Kohring 2009), (where the conservation organization takes interim ownership before
98 transferring to a public agency), although in PPR instead of a public agency the property is resold to a
99 private party. Depending on how the approach is applied, PPR could also be considered part of

100 'conservation development' ('projects that combine land development, land conservation, and revenue
101 generation while providing functional protection for conservation resources' (Milder 2007)).

102 Despite the uptake of PPR and its potential as a financially self-sustaining approach, its role in conservation
103 has received little attention. Focusing broadly on the PPR process (whether implemented via revolving
104 funds, revolving loan funds, or as part of a larger capital fund), we provide the first global summary and
105 analysis of PPR for private land conservation. This is done by collating information on current and past PPR
106 programs, collected from the literature, web searches and practitioner knowledge. We also review the
107 literature on PPR to identify the benefits and challenges of its use for permanently protecting private land.
108 With a particular focus on conservation policy, we describe how PPR fits alongside the other main
109 approaches to protecting biodiversity on private land, and assess the potential for modifications that may
110 improve conservation outcomes.

111 **Gathering information on PPR**

112 We conducted a systematic review of scholarly databases (Web of Science, Google Scholar, Proquest and
113 Scopus) and the world wide web for published and grey literature (predominantly reports, and excluding
114 webpage content) relating to the process of purchasing unprotected private land and reselling it with a
115 permanent conservation agreement (search terms are available in WebTable 1). Articles were included only
116 if there was specific mention of using revolving funds, revolving loan funds, and/or the process of
117 purchasing and re-selling private land to conserve biodiversity. We also added reports and book chapters
118 that we knew contained information on PPR but had not been picked up through the search. From each of
119 the articles in the final list we extracted any benefits or challenges of using PPR that had been identified,
120 and then coded these based on emerging themes (see WebTable 2 for coding framework).

121 Drawing from an exhaustive search of the literature, web searches and practitioner knowledge, we also
122 compiled the first comprehensive global list of current and past PPR programs that have been used to
123 purchase and resell private land. Programs were only included where they had been used for purchasing,
124 protecting and reselling private land for biodiversity. Where information was available we recorded their
125 total fund size, area protected, start date, end date, number of loans or properties protected, and the total
126 value of all purchases or loans.

127 **History and current state of PPR**

128 The full details of all PPR programs we collated for each country is given in WebTable 3. This data shows 21
129 PPR programs currently in operation globally, which grew rapidly from around 1990 (Fig 2; WebTable 3).
130 There has been a slight decline in the number of programs since around 2010, although without an
131 established definition or naming convention it is not clear if this represents a real decline. It is also likely

132 that not all PPR programs in existence were identified in our search. The first PPR fund was established in
133 1955 in the USA, the country where the majority of current programs operate (13 out of 21), along with an
134 additional two programs that are based in the USA but operate across both the USA and Canada. In
135 Australia, the first of the six revolving fund programs was established in 1989, with five currently in
136 operation. In Chile, one program has been established and has been operating for nine years. We identified
137 a total of eight PPR programs that have closed since they began operating.

138 The PPR approach has facilitated the protection of almost 684,000 hectares globally, 66% (450,000
139 hectares) of which has occurred in the USA (Fig 3; WebTable 4). Almost US\$384m is held in PPR funds
140 globally, with the size of PPR programs averaging US\$12.8m. By country, PPR programs covering both
141 Canada and the USA had the largest average size (US\$30m), with the USA having the largest amount
142 available in total (almost US\$214m; Fig 3). We note that these figures are underestimates as data was not
143 available for all programs.

144 **Outcome of comprehensive review**

145 We found a total of 72 documents that met our criteria for inclusion in the review. Of these, 47 were either
146 journal articles, books or book chapters, with the remainder comprising grey literature. Very few
147 documents focused solely on PPR, with the vast majority mentioning this approach as part of a broader
148 topic. The full list of articles is provided in WebTable 5.

149 **Benefits of the PPR approach**

150 A large range of benefits were attributed to PPR (Fig 4), some of which appear unique to this approach.
151 These included the ability of the PPR approach to recover costs and recycle money for continual land
152 purchase and protection – the most frequently cited benefit identified in our review (39 percent of all
153 articles). Surprisingly, there were only two specific mentions of the potential for PPR to be self-sustaining
154 (4 percent), and all but one of these came from the grey literature.

155 There were a number of benefits identified for PPR that also apply to other approaches for protecting
156 private land. These included the ability to strategically target important properties with high conservation
157 value (36 percent), for example land under threat of development, or land close to, complementing or
158 linking protected areas. The ability of PPR to conserve expensive land was raised by 15 percent of all
159 articles, particularly where costs could be recouped through resale, as was their ability to act quickly and
160 purchase land as opportunities arise (14 percent), their beneficial development of the conservation
161 property market (14 percent), and shifting land ownership to conservation-minded owners (14 percent).
162 The process was stated as having particular benefit where voluntary protection or acquisition approaches
163 were unlikely to be feasible, for example where landowners had been unwilling to participate or where
164 land was expensive (15 percent).

165 **Challenges for the PPR approach**

166 A summary of the challenges attributed to using PPR from the documents we identified are provided in
167 Figure 5. Some of these were unique to PPR, the most frequently cited of which was the limited demand for
168 conservation properties (15 percent of all articles). Related to this was the pressure to turn over properties
169 to achieve conservation (10 percent).

170 A number of challenges were raised for PPR that also apply to other protection approaches. Amongst these
171 were the pressure to recover costs through property sales (15 percent of all articles), the supply of
172 conservation properties (10 percent), the sequential consequences of making unfavorable decisions (6
173 percent), operating in a dynamic property market (6 percent), and making decisions under uncertainty with
174 limited information (13 percent). Also mentioned was the difficulty of operating with limited staff resources
175 and expertise (10 percent), the potential for negative community perceptions over engaging in the property
176 market (10 percent of articles), managing opportunity costs (7 percent), and the constraints of operating
177 with limited fund capital (7 percent).

178 **The role for PPR in private land conservation**

179 Our review finds PPR has a number of beneficial attributes that make it useful for permanently protecting
180 private land and increasing the contribution of PPAs. We have provided a summary of these in Table 1 and
181 compared them to other approaches. Some attributes are unique to PPR – most notable is the ability to
182 recover costs (eg purchase costs, as well as holding, protection and resale costs) through property resale,
183 which facilitates the protection of additional properties. More than 684,000 hectares has been protected to
184 date, and our review identifies heightened potential for PPR to protect expensive land (often in landscapes
185 that are valuable for other productive uses and which contain threatened ecosystems), due to the ability to
186 recover some, if not all, costs. This suggests PPR may be particularly useful where land values are beyond
187 the reach of, or inefficient for, acquisition programs, and/or where landowners are reluctant to enter into
188 permanent conservation agreements. However, we note that many of the articles in this review contained
189 only limited information on PPR. Whilst there are some related studies evaluating the impacts of
190 conservation development (eg Pejchar *et al.* 2007; Milder *et al.* 2008) and the cost-effectiveness of the pre-
191 acquisition approach (Armsworth and Sanchirico 2008), we found very few formal evaluations specifically
192 focused on PPR in either the academic or the grey literature, with Clark (2007), McBryde *et al.* (2005) and
193 Binney and Whiteoak (2010) providing the most detailed accounts. Alongside its growing use, the unique
194 attributes and process offered by PPR as a conservation tool highlights the need for further research, aimed
195 in particular at evaluating the approach's contribution to private land conservation and the creation of
196 PPAs.

197 Our review also found a number of challenges that likely limit the capacity for PPR to protect private land.
198 Being reliant on the property market means PPR is constrained by the demand for, and supply of,
199 conservation properties, particularly those that will enable cost recovery through resale. Adding a
200 permanent conservation agreement that restricts options for land use would likely reduce the number of
201 potential buyers, impacting upon resale times and prices. Moreover, a conservation agreement that
202 restricts development rights has the potential to diminish property values, suggesting at times managers
203 would likely need to consider selling properties at a financial loss, although the effect of these agreements
204 can be uncertain (Winfree *et al.* 2006). There are also social factors likely to influence the success of PPR
205 programs, partly relating to the characteristics individual properties (eg aesthetics, location), but also to
206 how buyers perceive the relative novelty of owning a high-conservation value property (Corcuera *et al.*
207 2002), and behavioral aspects that might impact on their decision to purchase such as social norms
208 (Adamowicz and Olewiler 2016). To some extent, PPR programs can minimize resale challenges by focusing
209 on properties attractive to conservation buyers, and designing agreements that allow for residential or
210 recreational use whilst protecting ecological values (Hardy *et al.* 2018). At present little guidance is
211 available about which properties are most suitable for PPR programs beyond general statements on
212 conservation value and attractiveness to market (Whelan 1997), and this would be worth exploring further.

213 In addition, managers of PPR programs need to deliver conservation outcomes amidst limits on fund capital
214 and the need to sustain their funds over time. Similar to other conservation acquisition approaches
215 (Parkhurst and Shogren 2005), purchasing a property for later resale results in foregone opportunities to
216 use those funds for alternative conservation actions (especially where the PPR process is undertaken using
217 parts of a larger capital fund also used for other types of activities). In the resale process, there are likely
218 notable opportunity costs for managers to consider. For example, an opportunity may arise to sell a
219 property at a loss, where the manager faces a decision of whether to accept the offer, or to hold onto the
220 property in the hope of obtaining a better offer in the future. This decision may not be straightforward, as
221 in a weak or declining property market the decision to reject the offer and hold the land results in funds
222 remaining tied up in the land, and opportunities to conserve additional land whilst the market is low are
223 foregone. However, if a manager declines the offer in a strong or rising market, the chance of receiving
224 higher future offers increases, but in this case the properties that are the opportunities on which to spend
225 these funds in future are also likely to be more expensive. Constraints on resources, expertise and
226 information likely limits the capacity for managers to account for the complex dynamics of the property
227 market and assess these opportunity costs (Naidoo *et al.* 2006), leading to considerable uncertainty over
228 the timing or nature of outcomes. Presumably a larger PPR fund (relative to the cost of conservation
229 properties) would help mitigate these challenges, providing greater capacity to purchase a mix of different
230 properties (i.e. a 'portfolio'), flexibility to absorb greater risks with recovering costs and resale times, and
231 the ability to regularly buy and turn over ('revolve') properties. Nonetheless, policy-makers and
232 practitioners should note that these challenges make it difficult for PPR programs to make large

233 conservation gains quickly (Binney and Whiteoak 2010), although how these impact on the effectiveness of
234 PPR programs is not yet clear. This would be worthy of future research, particularly in comparison to other
235 permanent protection approaches.

236 Having a mix of approaches is likely beneficial for implementing private land conservation (Doremus 2003)
237 and may also boost participation rates (see Greiner et al. 2008). The ability of PPR programs to utilize the
238 conservation property market and proactively create PPAs, like other forms of conservation development
239 (Milder 2007), makes PPR a useful part of the private land conservation policy mix alongside binding and
240 non-binding approaches, financial incentive payments, and acquisition. However, as PPR shares attributes
241 with other permanent protection approaches (see Table 1), policy-makers need to be aware of the
242 potential for overlap. For example, because both PPR and acquisition can be used to target specific
243 properties, with opportunities limited by landowners willing to sell, there is potential for property
244 purchases to be concentrated in the same area, which could inflate land prices or push development into
245 unwanted areas (Armsworth *et al.* 2006). Here collaborative approaches between conservation agencies
246 would be beneficial (Jansujwicz and Calhoun 2010; Gordon *et al.* 2013), but the issue highlights the need to
247 clarify a space for PPR in the conservation policy mix. From our review, we suggest the role for PPR is in
248 protecting private land with conservation value where: i) conservation values are compatible with and
249 attractive for private ownership; ii) an acquisition-to-hold approach or permanent agreement with existing
250 landowners is unlikely or infeasible; and iii) resale is likely to recover (at least most) costs within a
251 reasonable timeframe. Policy-makers considering the use of PPR should also note that due to their
252 constraints, the likely contribution of this approach is incremental protection of private land rather than
253 rapid gains (see also Cowell and Williams 2006), and should be thought of as a longer-term investment that
254 facilitates a gradual increase in the number of PPAs.

255 Despite its uptake, it is important for policy-makers to note that PPR is unlikely to be appropriate in all
256 regions. All of the programs identified in this review were operating in countries with predominantly neo-
257 liberal economies, and it is unlikely that PPR would be suitable without an existing market for private
258 conservation properties, or where demand for conservation properties is weak. This may also apply to the
259 type of fund (eg internal or external revolving loan fund), where perhaps due to the large number of land
260 trusts, and the market for conservation properties, all external revolving loan funds were based in the USA.
261 Regardless of the type of fund, conservation organizations need a pool of initial capital (usually raised
262 through government, philanthropic or private investment sources) with sufficient purchasing power to buy
263 important conservation properties. The Australian revolving fund programs, which are dedicated to the
264 purchase and resale of high value conservation land (and in some cases also covering staff and operational
265 costs), received much of their start-up capital from government (Cowell and Williams 2006). Furthermore,
266 the reliance on permanent conservation agreements means PPR is unlikely to be suitable where property
267 rights are not well defined or enforced (Pasquini *et al.* 2011). Organizations would also require the

268 authority to purchase land and establish conservation agreements, appropriate skills in ecological
269 assessment, expertise in real estate markets and staff resourcing to adequately assess, purchase, protect
270 and resell properties.

271 **Improving the implementation of PPR**

272 Our review suggests complex, cross-disciplinary decision-making is required for implementing PPR
273 programs. Property selection appears a particular challenge that draws together elements of economics,
274 social science, policy, ecology and conservation, characterized by limited information and high uncertainty,
275 with decisions having sequential impacts on future success. Despite the importance of property selection,
276 our review did not uncover research identifying which types of properties are most appropriate for PPR.
277 Presumably some properties have a mix of ecological, amenity and financial characteristics that make them
278 more suitable for PPR than others. The identification and prioritization of high conservation value sites can
279 be done in a number of ways (Wilson *et al.* 2006; Tulloch *et al.* 2015), and a socio-ecological approach could
280 help identify regions attractive to conservation buyers that will also benefit biodiversity (Ban *et al.* 2013).
281 But which mix of characteristics make a property suitable for fast resale and a high likelihood of recovering
282 costs? How do we trade-off between these characteristics to find the most important ones? And how can
283 we ensure both conservation and resale goals are met within the dynamic and uncertain nature of the real
284 estate market?

285 There are also broader questions about the use of PPR as an approach to conservation, and here insights
286 from economics could be particularly useful. For example, portfolio theory could help develop strategies to
287 manage risk and uncertainty, relating to both the mix of properties bought by PPR programs, and the place
288 of PPR programs amongst the broader range of conservation policy options (Doremus 2003; Ando and Shah
289 2014). Return on investment analysis could explore the relative benefits of different purchasing strategies
290 (Boyd *et al.* 2015), taking into account the net financial outcome of the purchase-protect-resale process
291 (i.e. resale price minus purchase and all transaction costs). Further, real options analysis could help
292 managers of PPR programs assess the timing of purchases (e.g. relative to property market trends) and
293 understand the associated sequential decision impacts (Ando and Shah 2014).

294 The ongoing implementation and improvement of PPR programs would benefit from additional research,
295 and we suggest five key questions as a starting point: i) to what extent can PPR programs leverage the
296 capital of conservation organizations, does this change between different types of PPR programs, and how
297 does this compare to other conservation finance tools?; ii) how do conservation outcomes scale with
298 increased size or risk profiles of PPR programs, and would pooling PPR funds across organizations provide
299 greater leverage of capital and enhanced conservation outcomes?; iii) how should PPR programs define a
300 portfolio of purchase decisions to balance their financial risk, and how much financial risk should a PPR
301 program take on?; iv) how much of a financial loss should PPR programs be willing to absorb given the

302 limited market for conservation properties and likely opportunity costs?; and v) what are the sequential
303 impacts of different purchasing strategies (for example, is it more effective to purchase properties with
304 exceptional conservation values and delayed resale than to purchase properties with lower conservation
305 values but a greater likelihood of rapid turnover, and thus provide faster incremental gains?)?

306 **Conclusions**

307 Increasing the amount of private land permanently protected for biodiversity is likely to remain an
308 important focus for global conservation efforts. Where supportive conditions exist, and with appropriate
309 property selection, PPR programs show promise as a self-sustaining approach for creating PPAs and
310 permanently protecting biodiversity on private land. Of interest to policy-makers, PPR programs may be
311 complementary to other approaches for conserving private land, protecting properties where acquisition is
312 expensive or otherwise infeasible (that are attractive for resale), or where landowners are unwilling to
313 enter into permanent conservation agreements. This potentially frees up capital for other acquisition funds
314 to buy other types of properties. Nonetheless, the implementation of PPR appears complex, and arguably
315 drawing insights from economics into decision-making could help increase the effectiveness of the tool,
316 whereby tradeoffs between conservation values and financial sustainability can be explicitly considered.
317 Beyond these immediate questions, a number of general issues with PPR remain unexplored: Which
318 properties are more suitable for private owners and which for conservation organizations, over the long
319 term?; How does the social landscape change with the ongoing implementation of PPR – as permanent
320 agreements become more common in the real estate market do they become more acceptable, or is there
321 a social or political ceiling to this approach?; Can they be used to encourage other sustainable land uses
322 beyond biodiversity conservation?; And what is the likely financial ceiling for setting up PPR programs given
323 the limited funding available for conservation? Resolving these issues will allow for more effective
324 application of PPR in conjunction with other approaches, and in turn, enhanced conservation of biodiversity
325 on private land.

326 **Acknowledgements**

327 This research was conducted by the Australian Research Council's Centre of Excellence for Environmental
328 Decisions (CE11001000104), with support from the Australian Government's National Environmental
329 Science Programme – Threatened Species Hub and RMIT University. The authors would like to acknowledge
330 the contributions of Story Clark who provided information on existing revolving funds, and Maria Plancarte
331 Fexas who provided graphic design assistance for Figure 3. Sarah Bekessy was supported by an Australian
332 Research Council Future Fellowship (FT130101225).

Accepted Article

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438 **Tables**439 **Table 1. The space for purchase-protect-resale approaches amongst other programs for permanent protection of private land**
440 **with conservation value***

Conservation approach	Main costs to organization	Key benefits	Key challenges
Voluntary covenants and easements	Initiation, administration Compliance, monitoring and enforcement Stewardship support	Little or no acquisition or management costs Conservation by existing landowners	Requires voluntary participation from landowners Maintaining landowner participation
Purchase-protect-resale	Purchase and re-sale Administration Compliance, monitoring and enforcement Stewardship support	Self-replenishing fund Target important properties Protect expensive land and recover costs Speed of intervention Develop conservation property market	Recovering costs through resale Purchasing re-saleable properties Market demand for conservation properties Requires landowners willing to sell Requires property turnover Maintaining new landowner participation
Acquisition-to-hold	Purchase and ongoing management	Specialist management Target important conservation properties Acquiring properties difficult to resell Speed of intervention	Requires landowners willing to sell Purchase and management costs Funding absolute property costs

441 * A more detailed version of this table is available in WebTable 6

442 **Figure legends**

443 **Figure 1. A property for sale in Tasmania, Australia, through the Tasmanian Land Conservancy revolving fund program (Photo**
444 **courtesy of Matthew Newton)**

445

446 **Figure 2. Timelines depicting the years of operation for purchase-protect-resale programs and the total number worldwide for**
447 **conserving private land.** Most of the 21 programs currently operating have emerged over the past 15 years. Crosses indicate
448 programs that have ceased operating. Data was collated using a review of academic and grey literature and consultation with
449 experts on PPR programs and all programs in the figure are detailed in WebTable 3.

450

451 **Figure 3. Number, average time of operation and average fund size of purchase-protect-resale programs used to permanently**
452 **protect private land.** More than US\$384m are available in PPR programs, which have protected more than 684,000 hectares. All
453 values are in USD. (see WebTable 4 for summary program data). These figures are underestimates as there are likely instances of
454 PPR not captured in our search, and that data was not available for all identified PPR programs.

455

456 **Figure 4. The frequency of articles mentioning each of the purchase-protect-resale benefits that arose from the literature review.**
457 Shown as a percentage of all articles found. * indicates benefits unique to PPR

458

459 **Figure 5. The frequency of articles mentioning each of the purchase-protect-resale challenges that arose from the literature**
460 **review.** Shown as a percentage of all articles found. * indicates challenges unique to PPR

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