Quantification of the weeds / birds battle on the Ashley-Rakahuri river

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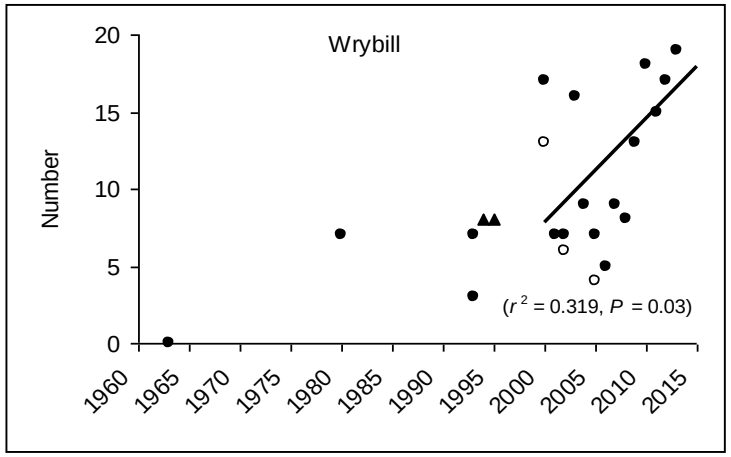
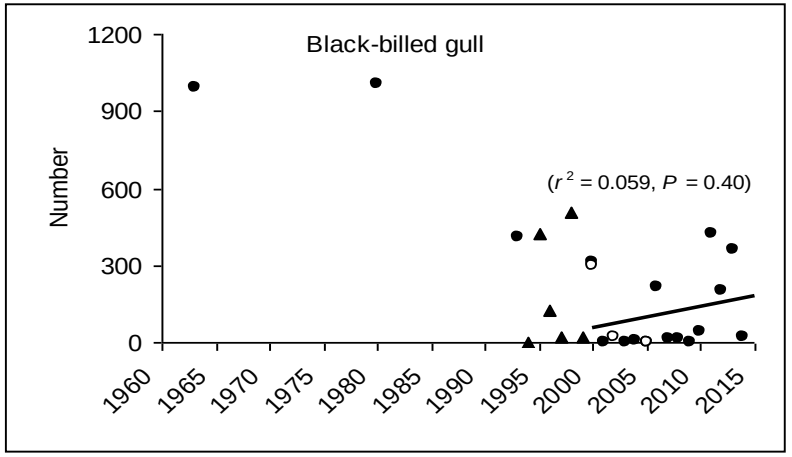
Ashley-Rakahuri Rivercare Group Inc

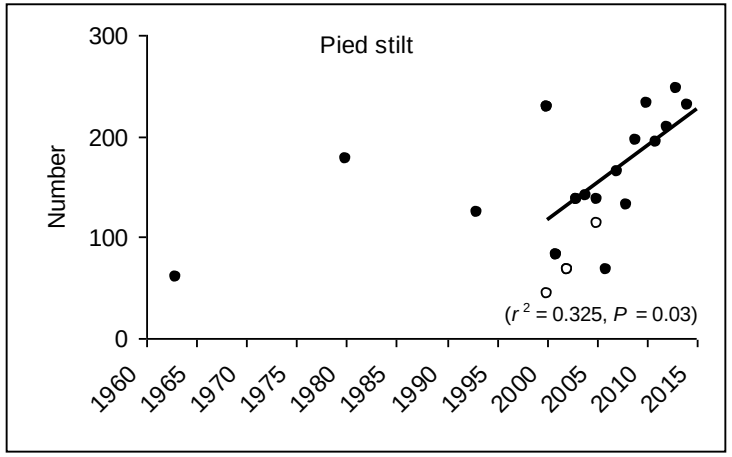
Braided river seminar,
Lincoln, June 25, 2017

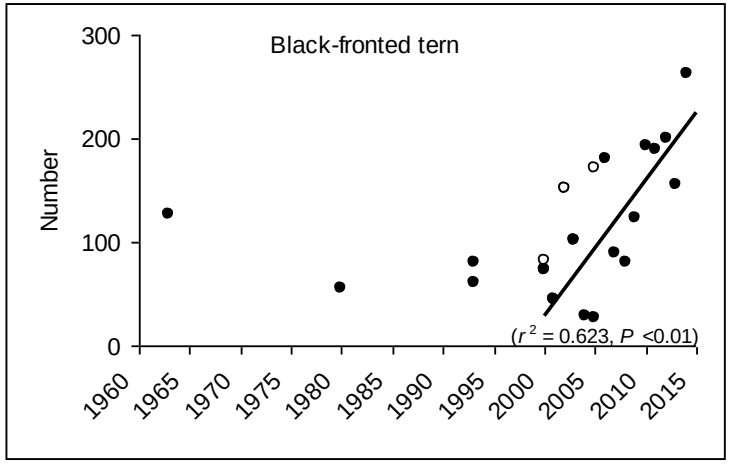
Positive (mostly significant) increase in bird counts since 2000

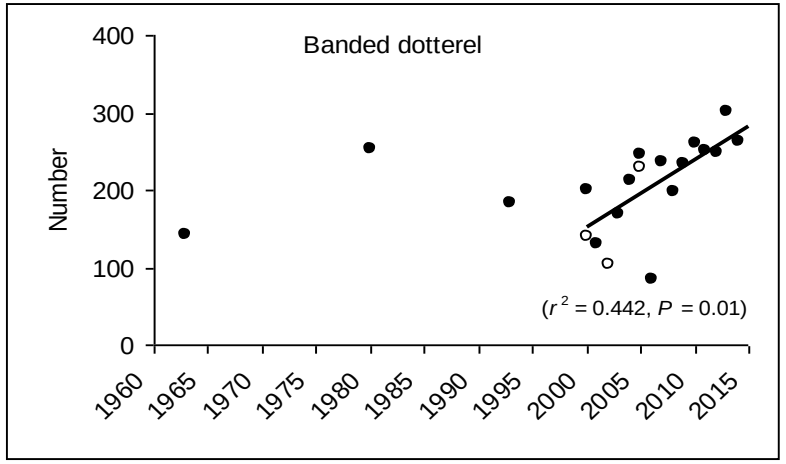
'… management actions have contributed to these successes …' Spurr and Ledgard (*Notornis*, 63(2), 2016)

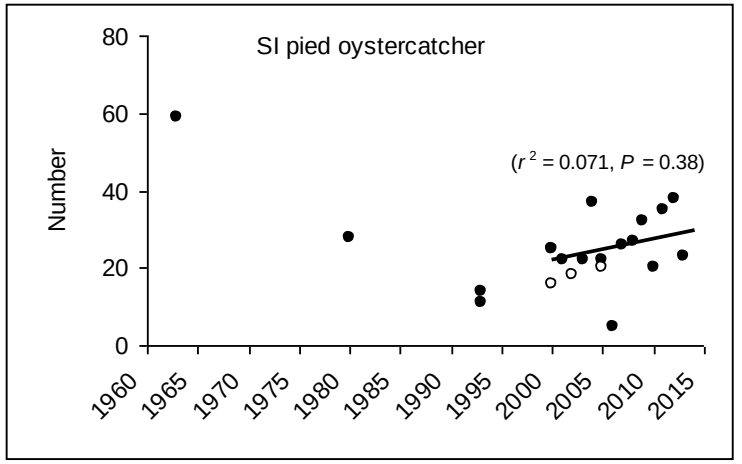




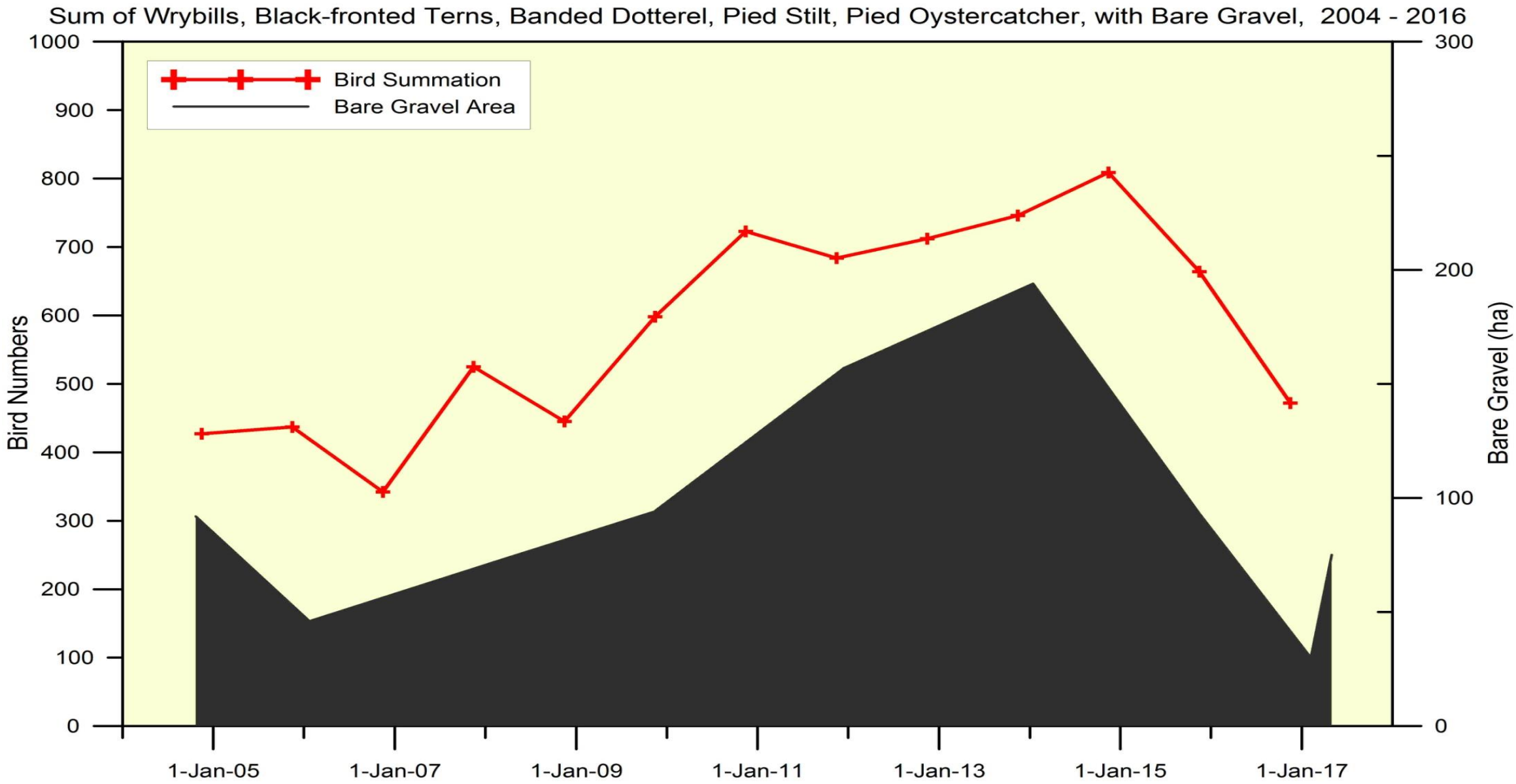




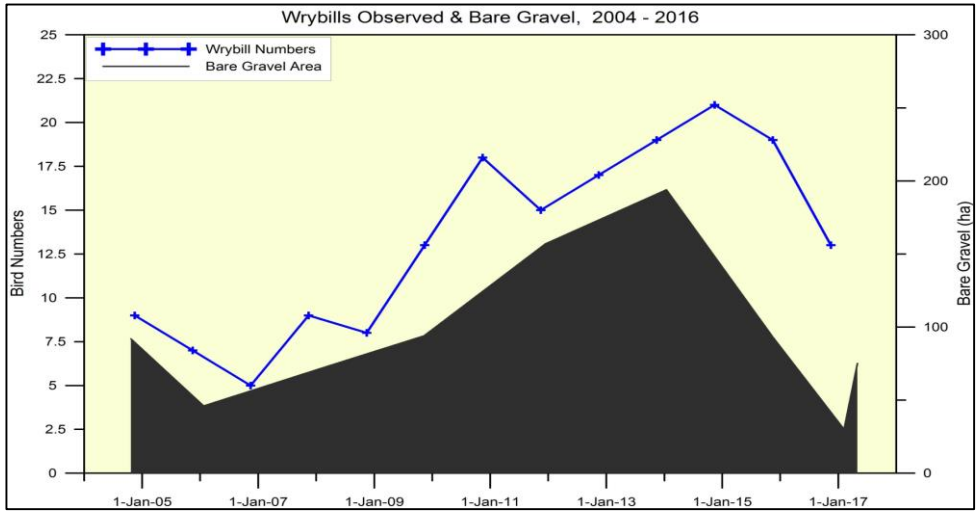


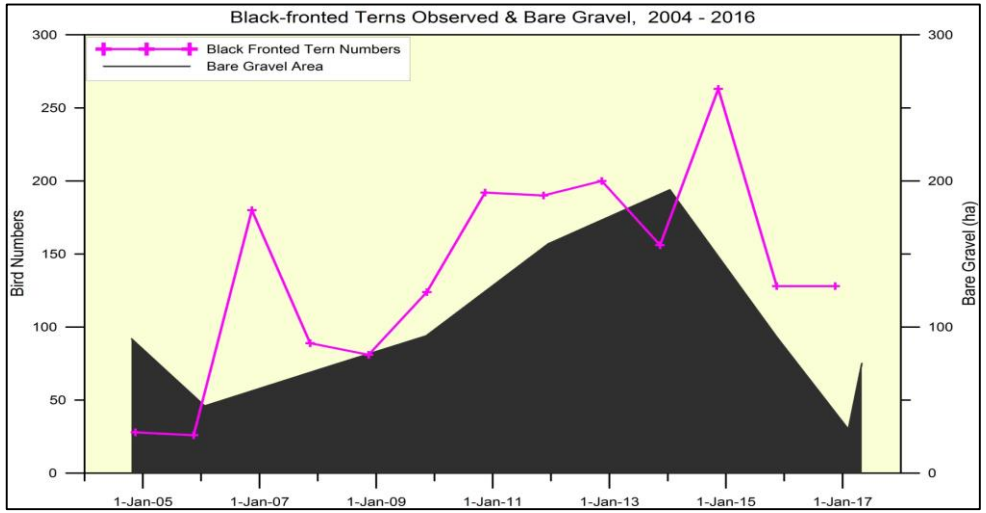


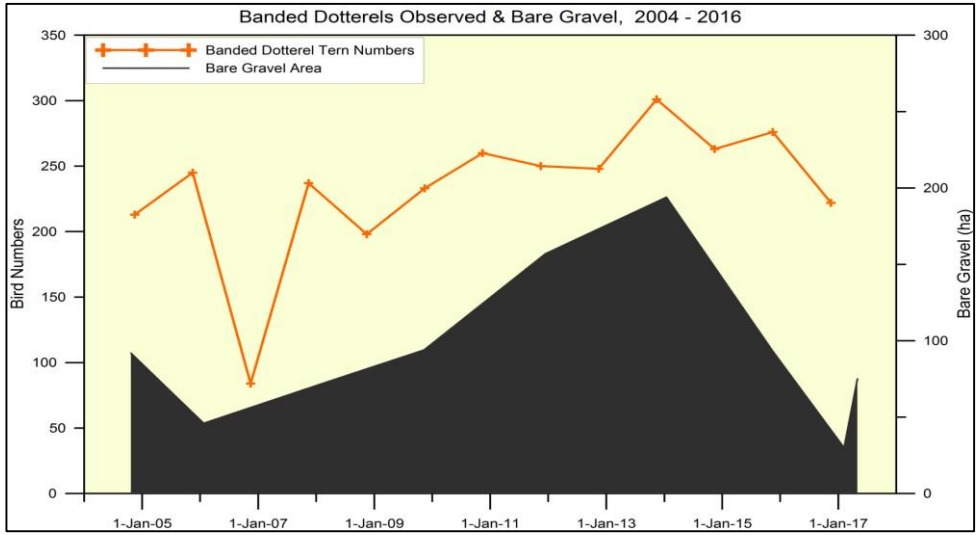
BUT, over last 2 years, an indication of a decline in bird populations.
This is linked to weeds invading bare gravel areas

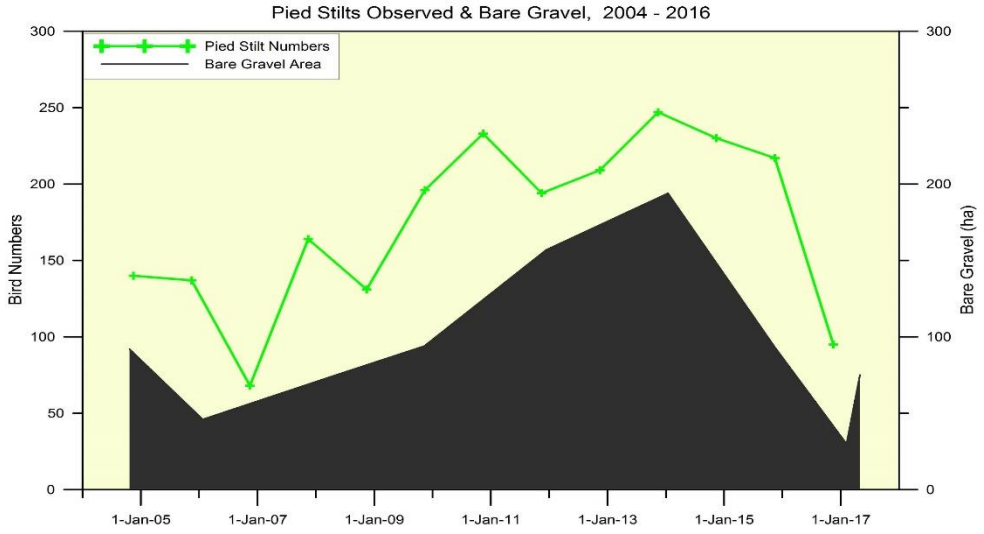


Supported by most individual species analyses

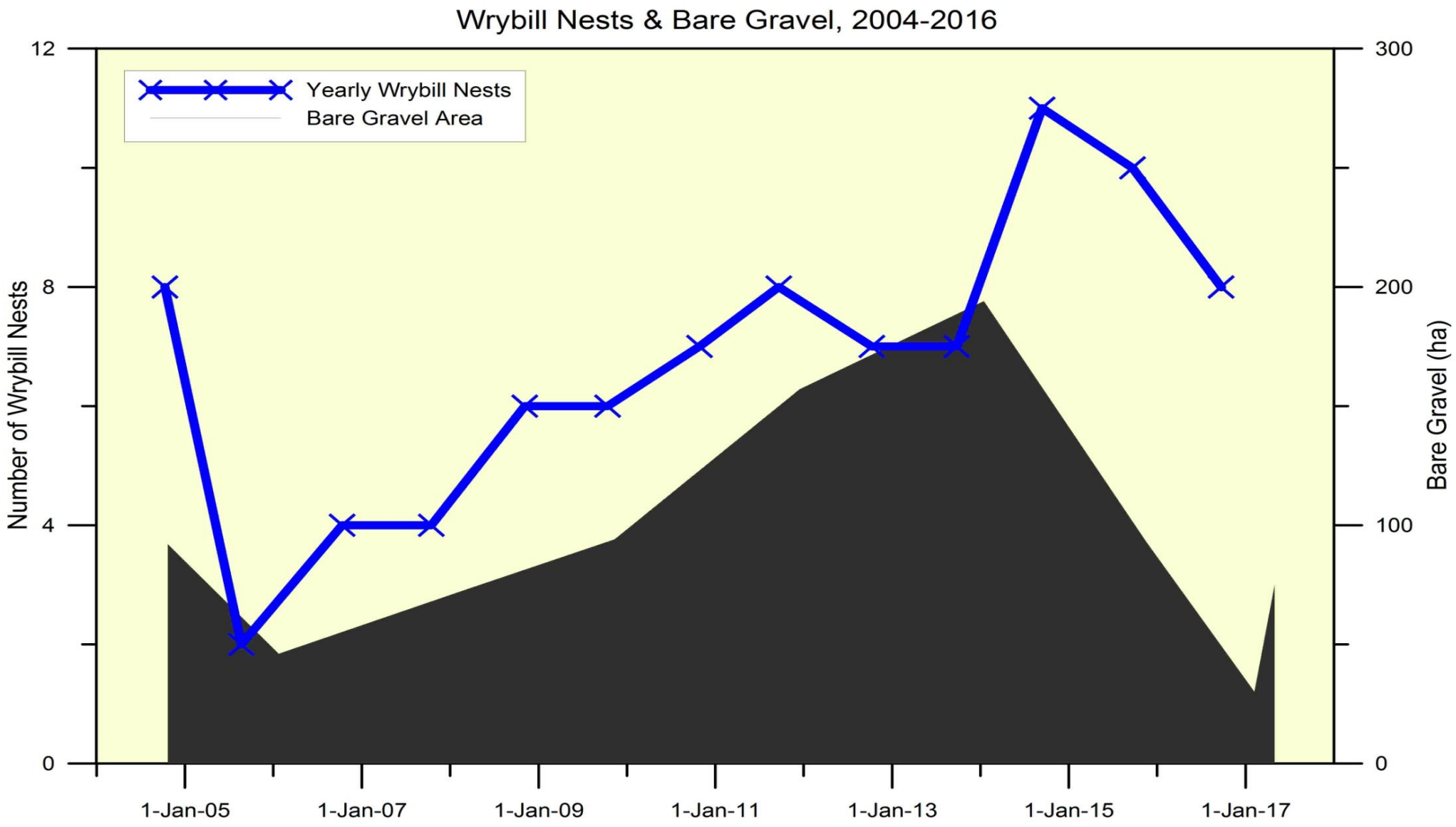




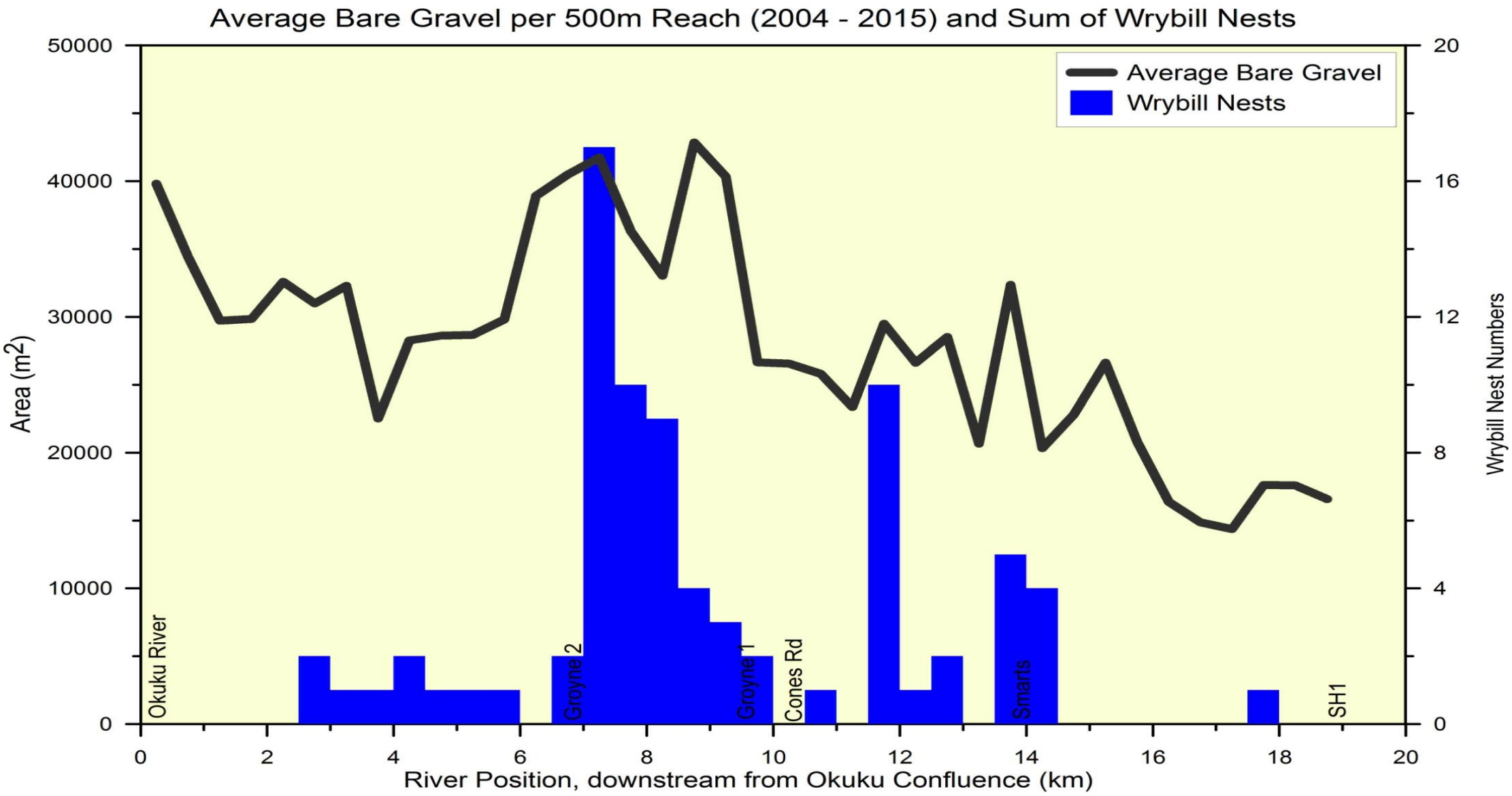




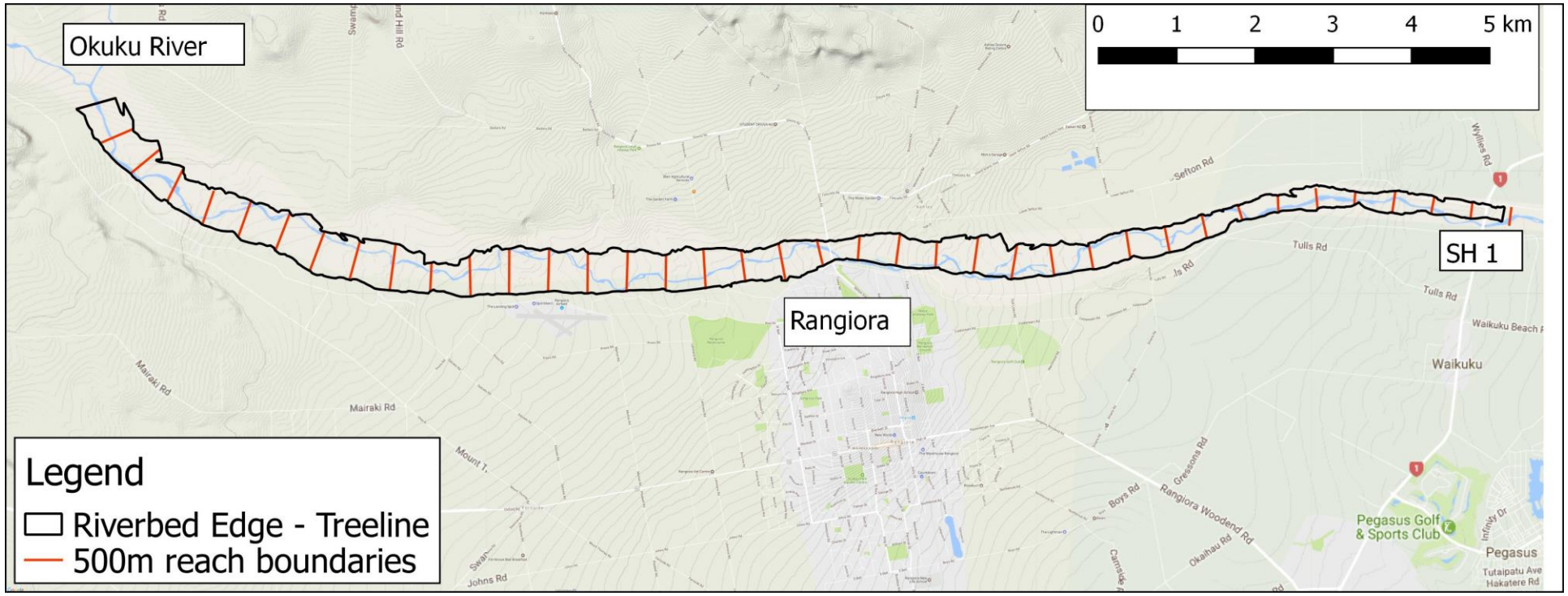
Also supported by bird breeding data eg., wrybill



Relationship between bare gravel areas / 500m and sum of wrybill nests



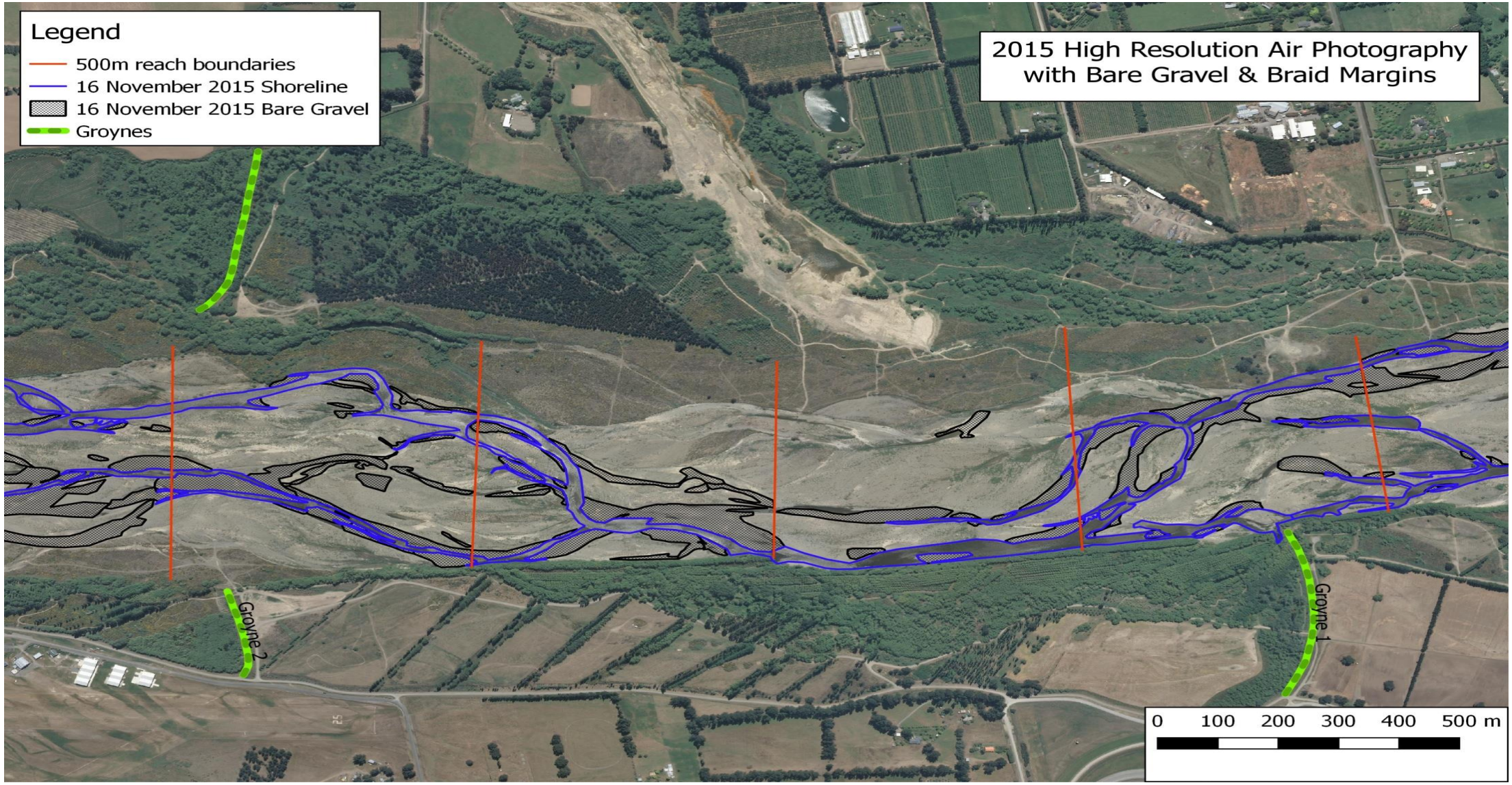
How have we quantified the weed increase and loss of bare gravel areas?



The river margins and bare gravel were digitized in 500m reaches using QGIS or Google Earth. QGIS was used to calculate areas.

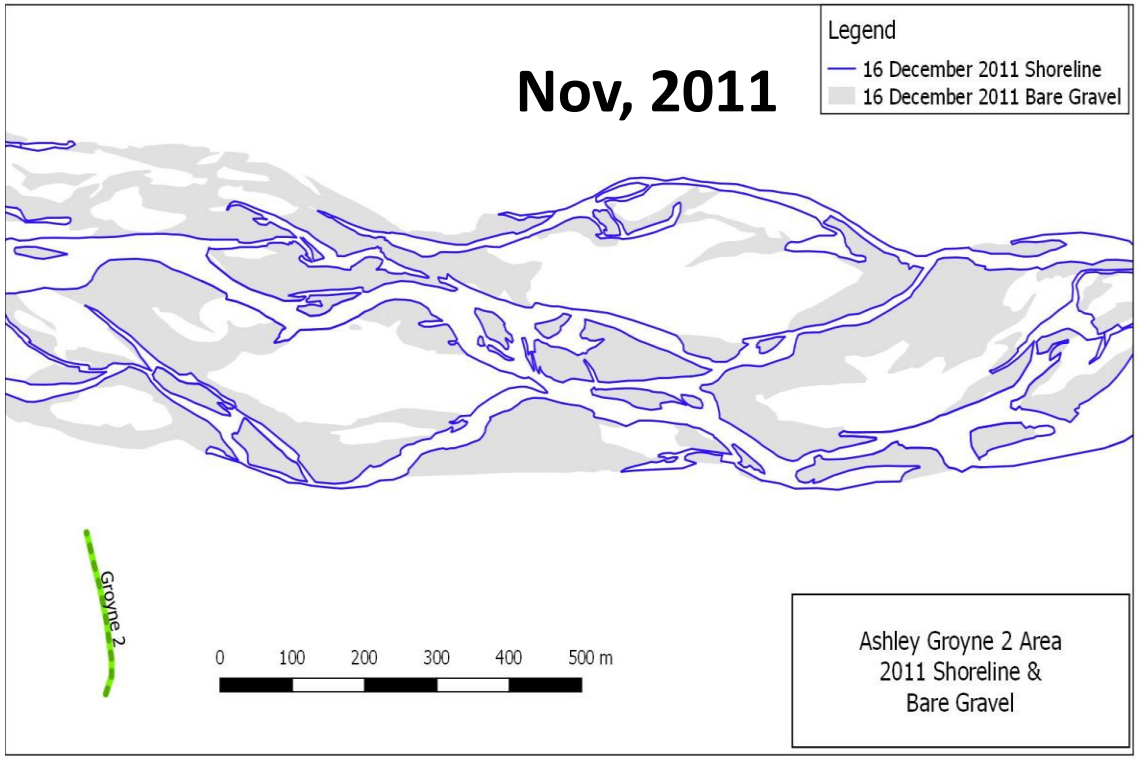
On the ground and in high resolution photos there is generally an obvious distinction between totally bare gravel (that measured) and gravel with weeds. This is harder to see on poorer quality images, but with experience it can be done with some confidence. A comparison of gravel areas for half of the river was made between a 2015 Google Earth satellite image and high resolution air photos taken a few days apart. There was a 1% difference, with more variation for individual reaches.

Example of more detailed mapping for one stretch of riverbed



Air or satellite photos from 2004, 2006, 2008, 2009, 2011, 2014 & 2015 used

Changes in the same stretch of riverbed over time



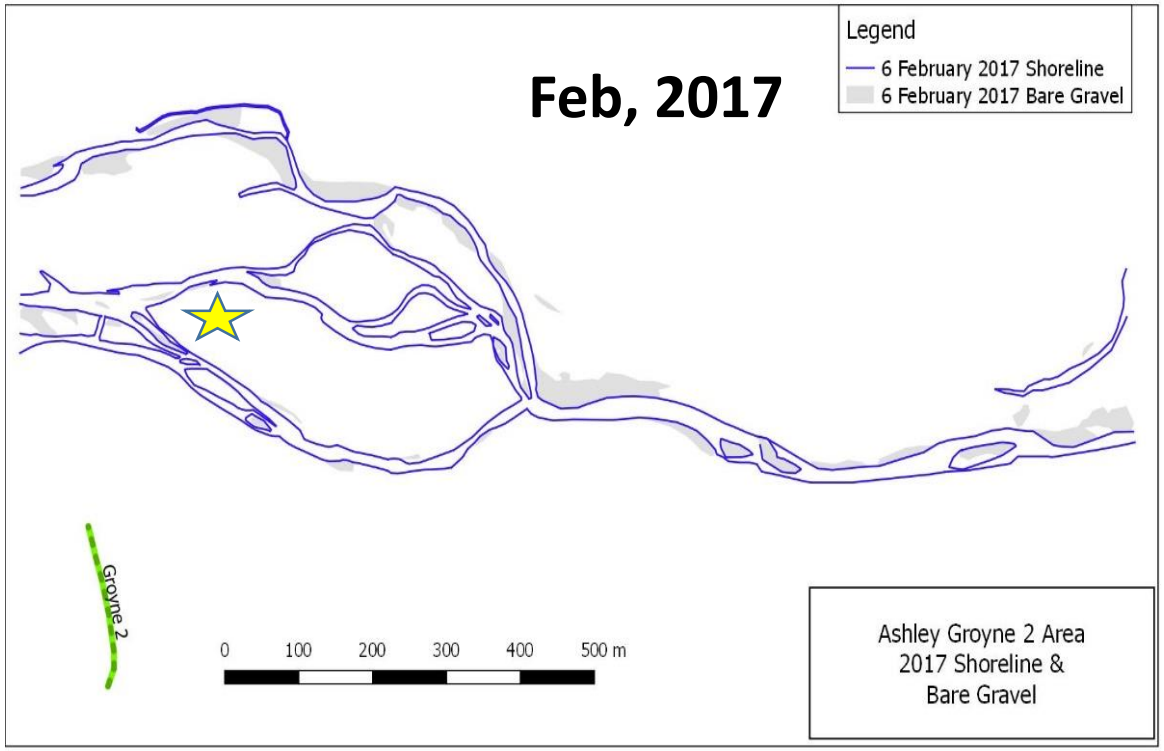


Photo point

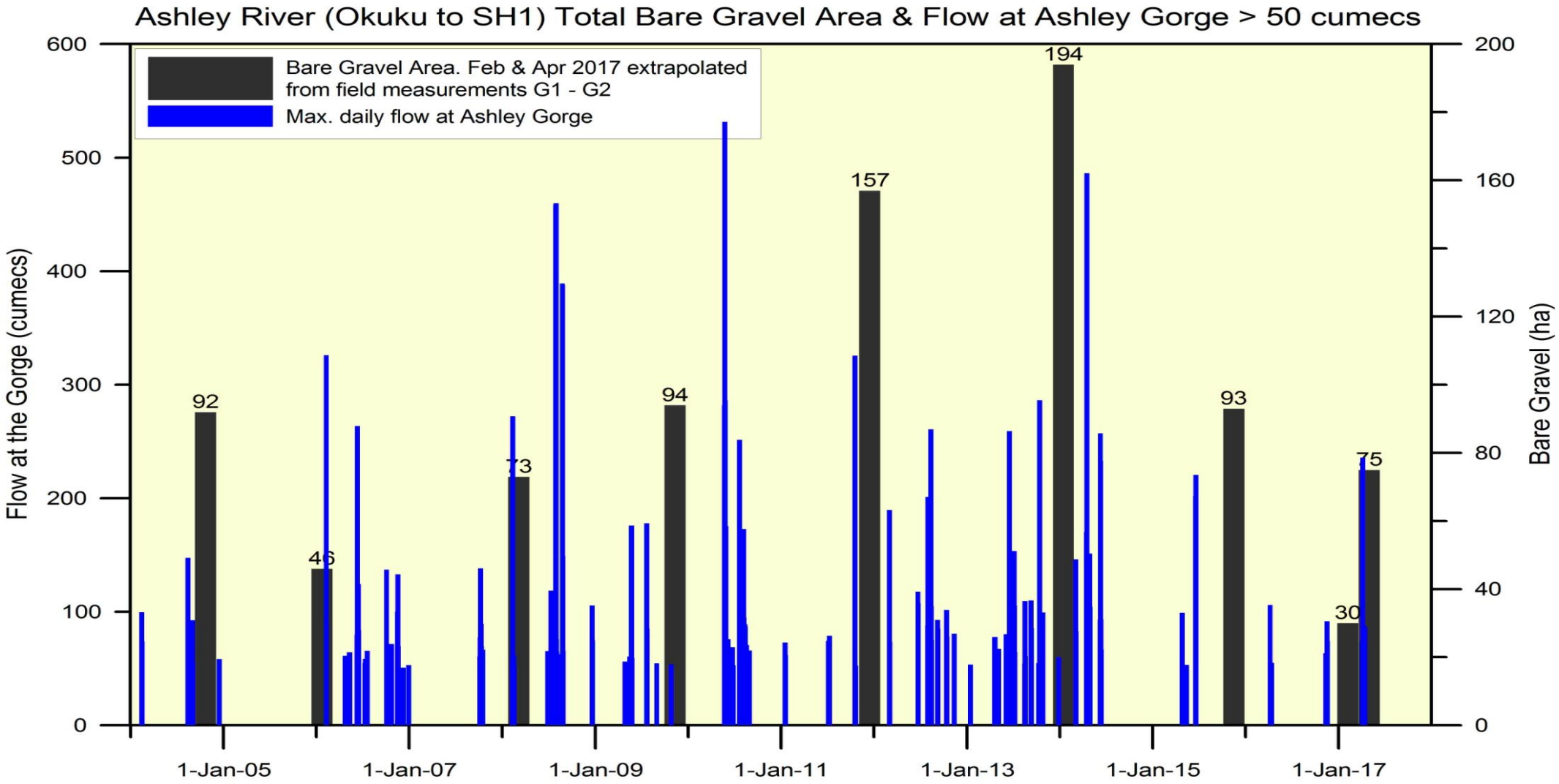
Photo point over time in same stretch of riverbed

Advance of weeds since 2014

Photo point out from Groyne 2

What are the reasons for this major increase in weed invasion since 2014?

Probably, a natural decrease in catchment maximum flows, coupled with fewer large floods.



Of added concern is recent increase of more persistent woody weeds in the riverbed fairway – gorse, broom and shrubby willows

The yellow tree lupin is a short-lived pioneer weed, readily removed by floods. Not so gorse, broom and willows

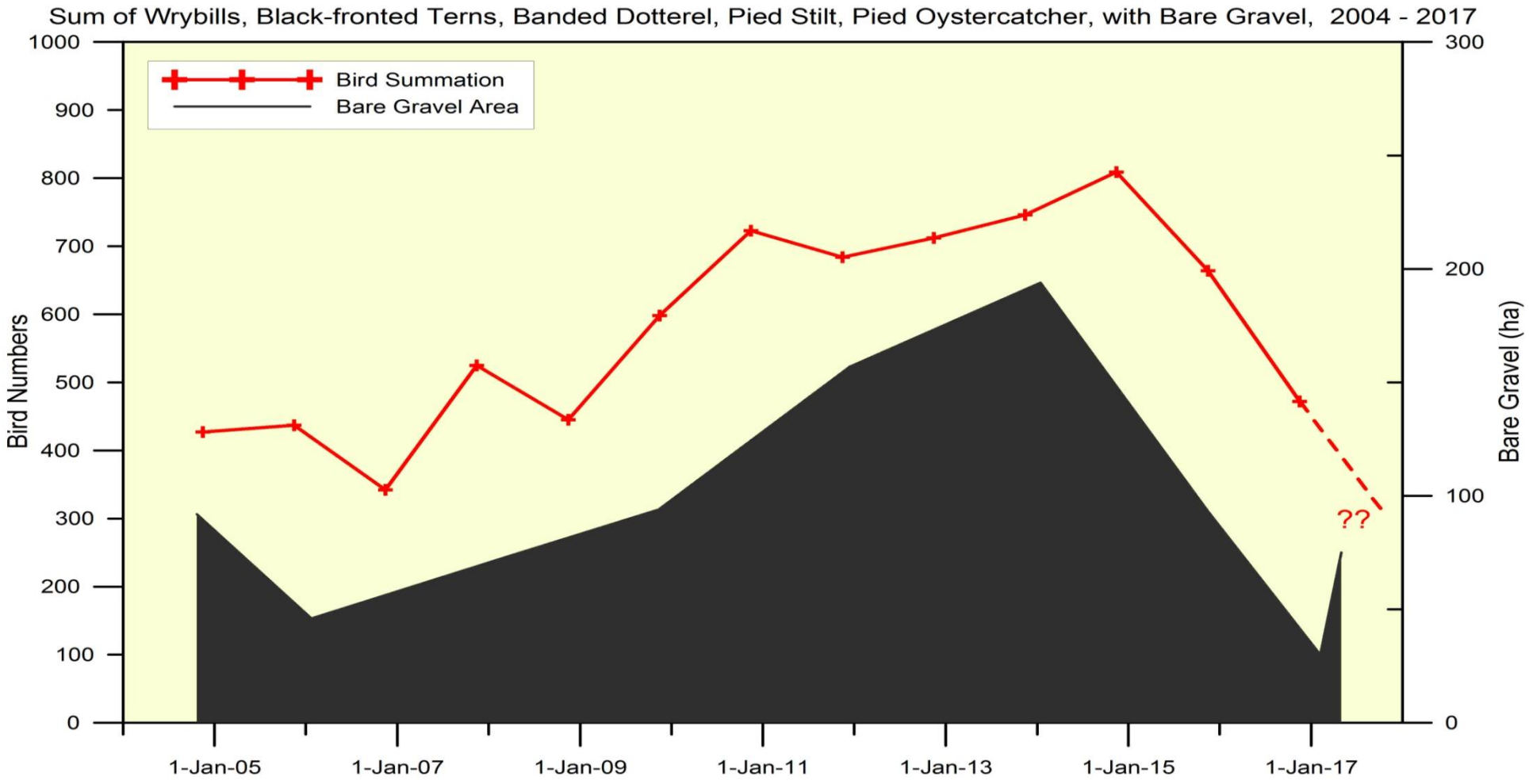
Young gorse establishing

Shrubby willows establishing from seed

In addition, important shallow water feeding areas are becoming choked with herbaceous weeds

So, what do we do about this bird decline associated with weed increase and bare gravel loss?

If we do nothing we seriously risk losing the indigenous shore birds which breed on the Ashley-Rakahuri river – species which have been there for 10's of thousands of years.



Will a return of floods do the job?
Recent April 6, 2017, flood indicates it will help, but not be enough.

It is estimated that this flood of 235 cumecs doubled the area of bare gravel from around 35ha to 70ha

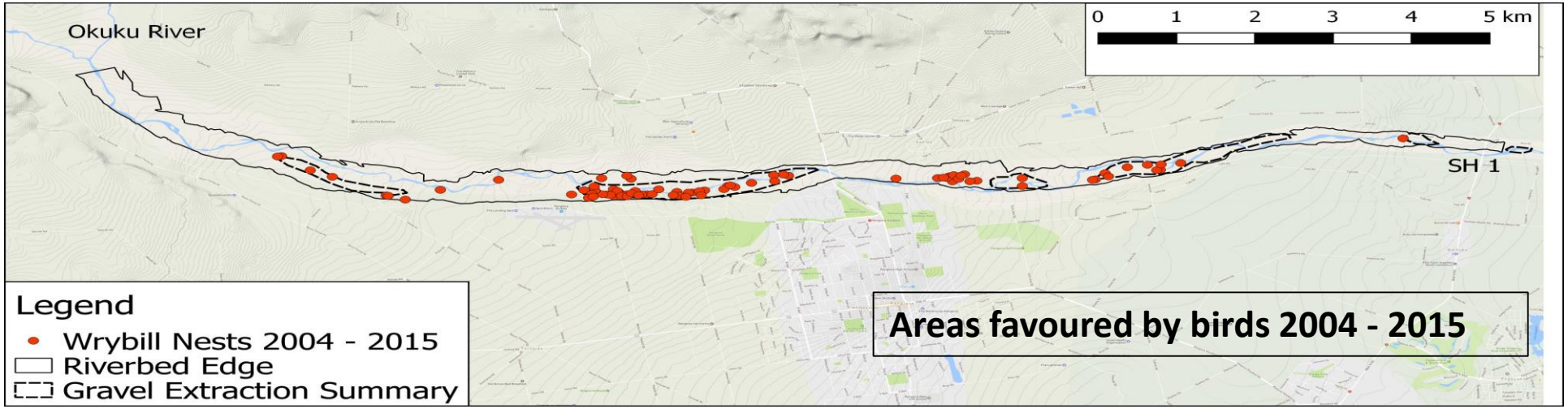
Traditional bare gravel creation by commercial shingle extractors certainly helps

So, no alternative other than to artificially clear weeds from the riverbed.

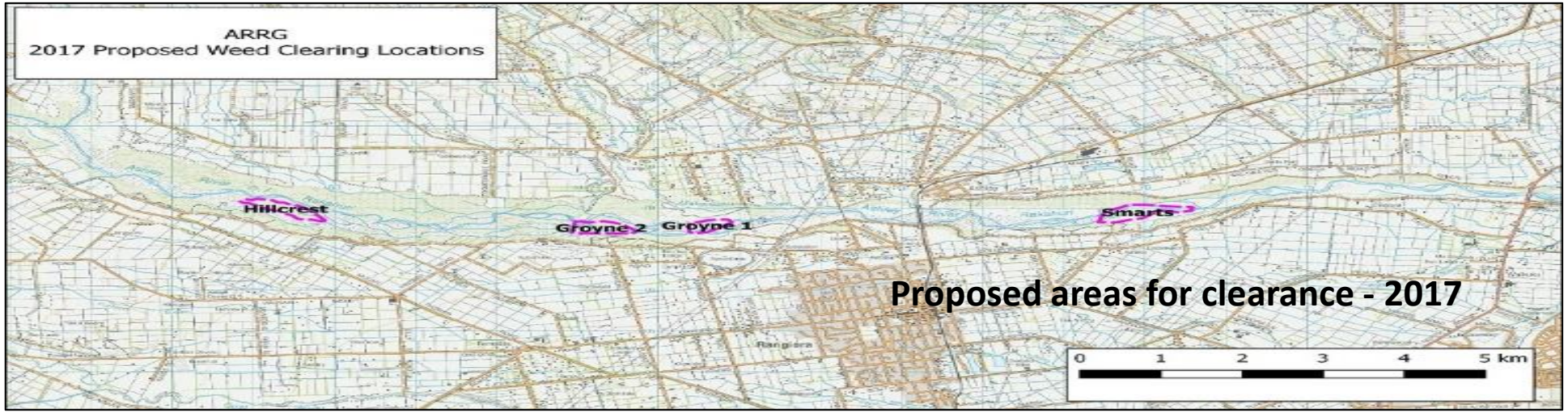
Has been tried in previous years

Variable results on Ashley-Rakahuri, but success elsewhere (eg., Clarence and Waitaki) indicates further work warranted.

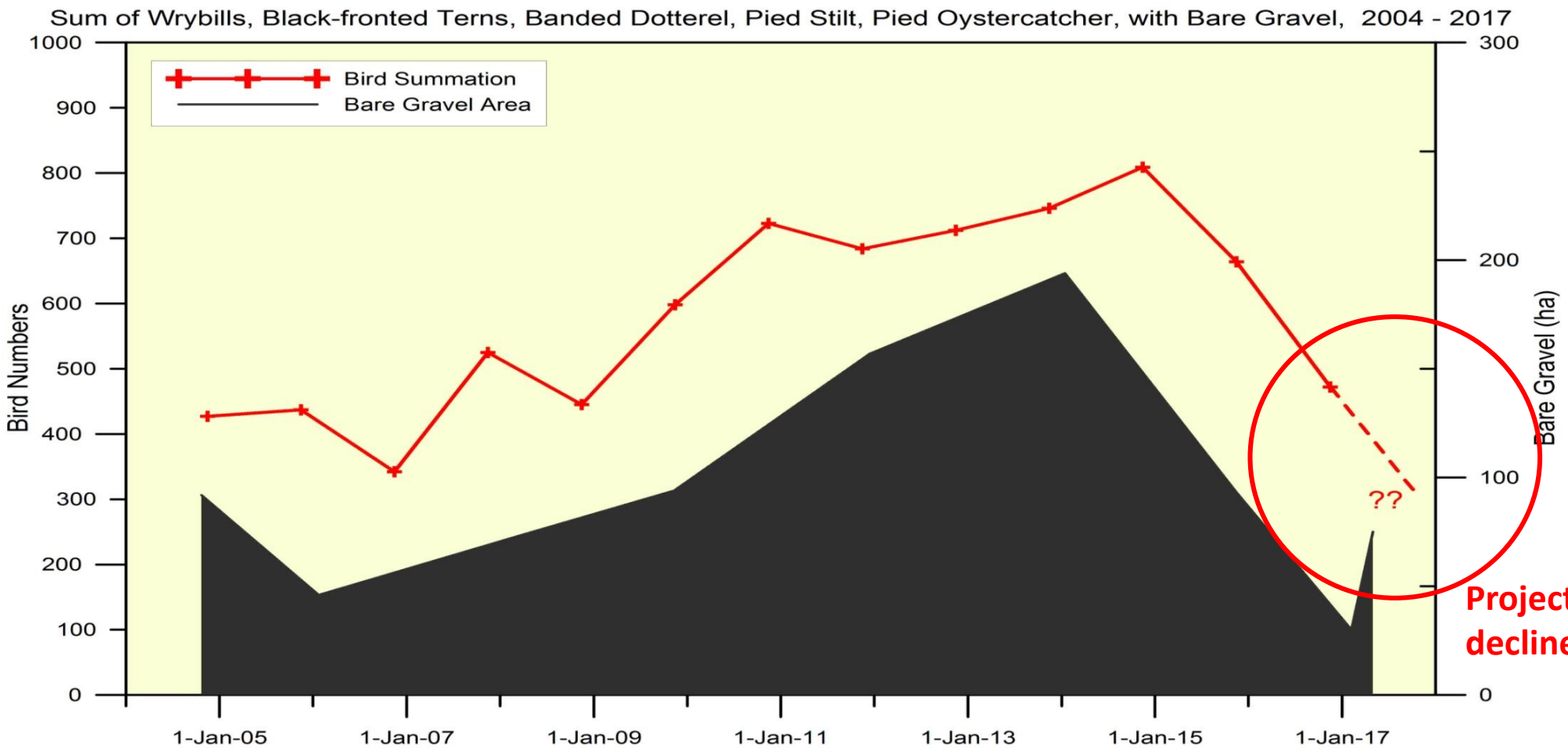
2017. Large clearances (50+ha) intended in sites historically favoured by birds



Favoured sites often associated with past gravel extraction areas



The evidence is clear. Without direct action to increase bare gravel areas, we risk losing the indigenous shore birds which breed on the Ashley Rakahuri river.



Projected on-going decline

It is one thing to suffer the consequences of undetected changes – it is quite another, if no action is taken when the consequences are clearly indicated beforehand.