# Knepp Castle Wildland Project

# Pondtail Area Woody Colonisation Transect 2016

*Kate Ryland, Dolphin Ecological Surveys, December 2016*

## Background

The Pondtail area woody colonisation transect was set up in September 2006, shortly after cattle were introduced to the northern block of the project area.

The 240m long transect starts at TQ15923 23380 (north of Pondtail) and runs 100 degrees east. It traverses arable reversion and parkland areas and crosses through two hedges.

Recording in the transect comprised an assessment of 120 contiguous 2m x 2m quadrats. These individual quadrats were surveyed for the presence of woody species (tree seedlings or developing scrub) along with coarse herbaceous "weedy" species.

The purpose of setting up this long transect was to find out how woody seedling recruitment and cover of scrub and selected coarse herbaceous species responded to extensive cattle grazing in this area of former arable reversion and parkland. The herbaceous species selected for recording were rush, thistle, ragwort, bracken and dock.

Repeat recording of woody colonisation within this transect over time is also intended as a tool to help document the extent to which hedgerows expand into fields as well as the development of patches of in-field scrub that may act as protection for tree seedlings from grazing and browsing.

## 2016 Survey of the Transect

On 28th July 2016, 10 years after this long transect was established, the Pondtail area woody colonisation transect was surveyed for the second time using the same methodology. The survey was carried out by Kate Ryland with Penny Green, the Knepp Ecologist.

In 2016 the surveyors encountered considerable difficulty re-locating the exact starting point of the transect due to the GPS and compass inaccuracy and fluctuations that occur under the high voltage power lines at Pondtail.

Unfortunately photos of the woody colonisation transect were not taken in 2006 as these would have been invaluable to pinpoint the original start and end points of the transect.

In 2016 this omission was put right and photos were taken at several points along the transect. This should help to ensure that in future years it is easier to re-locate the starting point and the exact direction in which to record quadrats along the transect.

## Results

There is considerable variation in the results obtained from the 2006 to 2016 woody colonisation surveys but interpretation of these results should be carried out with caution because the methodology used to record data in the original transect was quite imprecise.

The probable slight shift in the path of the transect should also be taken into account when comparing data between the two surveys.

However, there are some very interesting result on a broad scale of the changes in woody vegetation and coarse species that are taking place across this area.

**Woody Species**
In 2006 there were very few tree seedlings recorded in the transect.

> "...only 3 oak, 2 ash and 3 hawthorn; with one patch of blackthorn *Prunus spinosa* that was spreading out from a hedge by means of suckers. Only hawthorn was recorded in the first hedge crossed (TQ1595 2345), 4 shrubs and 3 seedlings. Hawthorn, blackthorn, privet *Ligustrum vulgare* and rose *Rosa sp* were recorded as shrubs in the second hedge (TQ1610 2335)".
> *Extract from Monitoring Strategy for Knepp Castle Estate. Theresa Greenaway 2007.*

By 2016 the amount of woody growth had increased considerably to:

- 17 oak seedlings
- 1 seedling and 4 hawthorn shrubs
- 73 blackthorn suckers and 3 shrubs plus the hedgerow itself
- 3 privet shrubs
- 6 seedling and 3 rose shrubs

The first hedge must have been crossed at a different point in the two surveys as it was recorded as being entirely blackthorn scrub in 2016 but entirely hawthorn as in 2006.

The second hedge seems to have had a similar composition in the two surveys so the transect may have drifted back on course. The quadrats at the second hedge contained 4 hawthorn shrubs and 3 small privet shrubs but no rose in 2016.

Blackthorn showed the greatest increase in records along the transect in 2016, not only in association with the hedgerows but also at other points along the route. Rose seedlings were also present in small numbers at the eastern end of the transect.

The eastern end of the transect, beyond the second hedge and ditch (quadrats 105 to 120), was the area where woody colonisation of the grassland sward was most successful and varied.

**Coarse Herbaceous Species**
The change in the occurrence of coarse, weedy species in the transect over the last decade is quite striking. The 2007 monitoring report states:

> "*The low occurrence of thistle, and absence of ragwort, can be ascribed to the dense grass sward over nearly all of the transect except where grazing and walking by rabbits and cattle had worn a bare strip of ground along the sunnier sides of the hedgerows".*

In 2006:

- Bramble was in 7 (5.8%) of the quadrats
- Rush was in 1 (0.8%) quadrat
- Thistles were in 16 (13.3%) quadrats
- Docks were in 13 (10.8%) quadrats

All these species were present at less than 25% cover in the 2m x 2m quadrats. Ragwort and bracken were not recorded in the transect.

In 2016 the distribution and the density of cover of thistles had increased significantly, ragwort had appeared, dock and rush were broadly similar and bramble was not recorded. The absence of bramble records is probably due to the changed alignment of the transect in 2016.

- Bramble was absent from the quadrats
- Rush was in 2 (1.7%) of the quadrats
- Thistles were in 49 (40.8%) of the quadrats
- Ragwort was in 6 (5%) of the quadrats

- Docks were in 11 (9.2%) of the quadrats.
- Bracken was again not recorded in the transect.

Whilst most species were present at less than 25% cover in each quadrat the amount of thistle in some parts of the transect was up to 75% of a 2m x 2m square and in one case exceeded 75% cover.

The survey results are contained in full in a separate spreadsheet but are summarised in tables below, in the same format as in the original 2006 survey report.

One plant of interest that was noted along the transect in 2016 was lesser centaury *Centaurium pulchellum* at TQ15956 23376. This is an attractive but not uncommon plant of open ground, woodland rides and other such habitats.

Summary Tables

## Table 1. Woody seedling species recorded in the transect

| QUADRAT No. | OAK | HAWTHORN | BLACKTHORN | PRIVET | ROSE |
|---|---|---|---|---|---|
| 17 | 1 | | | | |
| 19 | 1 (browsed by rabbit) | | | | |
| 24 | 1 | | | | |
| 26 edge of hedge | | | 1 (browsed) | | |
| 27 hedge | | | 4m x 4m scrub | | |
| 28 hedge | | | 4m x 4m scrub | | |
| 29 * | | | 26 stems (some but not all browsed) | | |
| 30 | | | 6 (all browsed) | | |
| 43 | 1 | | | | |
| 49 | 1 | | | | |
| 61 | 1 | | | | |
| 67 | 1 | | | | |
| 73 | 1 | | | | |
| 101 | | | 4large (all browsed)<br>3 small (1 browsed) | | |
| 102 | 1 | | 5 large (all browsed)<br>7 small | | |
| 103 hedge | | 4 shrubs x c.5m height | 3 small shrubs | 3 small shrubs | |
| 104 ditch | | | | | |
| 105 | 1 | | | | |
| 106 | 2 | | | | |
| 109 | 1 | | | | |
| 110 | | | I large<br>4 small | | |
| 111 | | 1 | 3 (1 browsed) | | 3 |
| 112 | 1 | | 3 small (all browsed) | | 3 |
| 113 | | | 2 large (browsed)<br>3 small | | |
| 114 | | | 1 large (browsed)<br>4 small | | |
| 115 | | | | | 3 x1m shrubs (browsed) |
| 116 | 1 (browsed) | | | | |
| 120 | 2 (1 browsed) | | | | |
| **Total woody species records** | **17 seedlings** | **1 seedling<br>4 shrubs** | **73 suckers or seedlings, 3 shrubs + block of scrub in hedge** | **3 shrubs** | **6 seedlings<br>3 shrubs** |

Notes.

Quadrats with no records are excluded from the result tables. See spreadsheet for full results.

Actual number of seedlings were recorded except in hedges. Most blackthorn stems recorded are suckers rather than seedlings.

* Quadrat 29 fell at the edge of the hedge and had blackthorn suckers of between 5cm and 150cm in height. Some were browsed and some not. Each stem within the quadrat was counted but browsing was not recorded for each stem.

## Table 2. Distribution of bramble and coarse herbaceous species in the transect

Size classes: <25%, 25-50%, 50-75%, >75%

Key:

| <25% | 25-50% | 50-75% | >75% |
|---|---|---|---|

| Quad No. | Bramble | Rush | Thistle | Ragwort | Bracken | Dock |
|---|---|---|---|---|---|---|
| 1 | | | | | | |
| 2 | | | | | | |
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |
| 16 | | | | | | |
| 23 | | | | | | |
| 24 | | | | | | |
| 25 | | | | | | |
| 26 | | | | | | |
| 30 | | | | | | |
| 31 | | | | | | |
| 32 | | | | | | |
| 33 | | | | | | |
| 34 | | | | | | |
| 35 | | | | | | |
| 36 | | | | | | |
| 37 | | | | | | |
| 38 | | | | | | |
| 39 | | | | | | |
| 40 | | | | | | |
| 41 | | | | | | |
| 42 | | | | | | |
| 43 | | | | | | |
| 44 | | | | | | |
| 55 | | | | | | |
| 56 | | | | | | |
| 57 | | | | | | |
| 58 | | | | | | |

| Quad No. | Bramble | Rush | Thistle | Ragwort | Bracken | Dock |
|---|---|---|---|---|---|---|
| 59 | | | | | | |
| 60 | | | | | | |
| 61 | | | | | | |
| 63 | | | | | | |
| 100 | | | | | | |
| 103 | | | | | | |
| 105 | | | | | | |
| 106 | | | | | | |
| 108 | | | | | | |
| 110 | | | | | | |
| 111 | | | | | | |
| 112 | | | | | | |
| 113 | | | | | | |
| 114 | | | | | | |
| 115 | | | | | | |
| 116 | | | | | | |
| 117 | | | | | | |
| 118 | | | | | | |
| 119 | | | | | | |
| 120 | | | | | | |
| Total no. quadrats with records | 0 | 2 | 49 | 6 | 0 | 11 |
| % of quadrats with records | 0 | 1.7 | 40.8 | 5 | 0 | 9.2 |

## Recommendations

Ideally the transect should have permanent, marked start and end points to allow direct comparison of results between surveys. However, such markers can bring their own problems, for example fixed tall marker posts can draw livestock to them (they are attractive scratching posts) and congregating livestock will certainly have a local impact on scrub establishment and skew the results. Using low level markers would be less attractive to cattle and horses but could create a hazard for livestock or people and are often difficult to re-find in tall vegetation. The alternative is to use buried transponders or metal markers that can be found with suitable detecting equipment. This option is the most expensive but should be considered if funds become available.

A programme of photographic monitoring of the development of scrub here and in other parts of the site will add enormously to the long-term picture of how woody vegetation is colonising the Wildlands. Remote sensing using UAVs to map scrub was not available in 2006 but is now becoming a common technique for monitoring vegetation structure over time and is much less expensive than it used to be.

# 2016 Woody Colonisation Transect Photos

1. Start of transect

2. View towards first hedge

3. & 4. First hedge

5. View east from first hedge

6. Worn track at base of first hedge

7. Developing scrub edge along hedge

8. Scrubby corner

9. Developing blackthorn

10. Quadrat on hedge edge

11. Grassland between the hedges

12. View of second hedge

13. & 14. Blackthorn suckers and oak seedling in grassy sward

[1]15. View along second hedge from north

16. View east from 2nd hedge along transect

17. East along final section of transect

18. Patch of developing scrub

19. View west from end of transect

20. View of sward in eastern field

21. Knepp Ecologist admiring developing scrub