

# **Reconstructing the Agricultural Landscape of the South Downs, England: an Examination of the 1940 and 1941 World War II Plough-up Campaigns**

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## **Summary**

World War II and the following decades are often regarded as a pivotal point in the changing fortunes of British agriculture during the 20th Century. Preparations for the wartime emergency included a National Farm Survey that would reveal land capable of more intensive production. This paper outlines the development of an historical GIS of different data sources and focuses on the ensuing 'plough-up' campaigns of 1940 and 1941 on the South Downs, England and their legacy during the post-war decades as well as factors contributing to continuity of occupation by farm families.

## **KEYWORDS:**

Agricultural restructuring, World War II, agricultural landscapes, historical GIS

## **1. Introduction and Background**

World War II is often regarded as a pivotal point in the changing fortunes of British agriculture during the 20th Century. The need for a concerted and coordinated response to maintaining a flow of food for the home population during the war time emergency precipitated an era of state intervention in the agro-food industries unknown in peace time. One manifestation of this effort was the 1941-43 National Farm Survey (NFS) of farmers with 5 or more acres (2.03 ha) of land. One of its objectives was to provide information about land regarded as 'under productive', which could be made improved by the so-called plough-up campaigns and by planting or sowing with crops that were in short supply. Access to the NFS documents became in the mid-1990s and they constitute an unequalled national historical data source of qualitative and quantitative data including maps about individual farms, although care is needed when using them for research purposes (Taylor et al., 2012).

This paper concentrates on the statistical population of over 500 farms recorded in the NFS with addresses and land in a set of 78 contiguous parishes stretching across the South Downs. By the mid-19th century the South Downs had become a well defined sheep and cereals farming region (Short 1999) that started to change early in the 20th century with the arrival of artificial fertilisers and cheap imports of sheep products. During the post-World War II (WWII) era the push towards increased self-sufficiency in temperate crops (e.g. Hodge, 1999) and national and subsequently European political intervention in the agricultural industry incentivised farmers on the South Downs (and elsewhere) to intensify their production systems. Ploughing-up grassland during WWII may be linked with modernisation of farming and continuity of occupation during the post WWII decades.

## **2. Methodology**

The focus on the South Downs in East and West Sussex reflects Short and Watkins's (1994)

assessment of the NFS as being relatively complete and detailed in these counties, although NFS surveyors were more rigorous in recording the area of land ploughed-up on West Sussex farms. Secondly, the South Downs was considered as a candidate area for national park designation shortly after WWII following enactment of the National Parks and Access to the Countryside Act (1949) and achieved this status some 60 years in April 2011. Another reason for focusing on the South Downs is that the research draws on a series of linked projects carried out over a number of years that have included this area as part of a broader exploration of the changing agricultural landscapes and systems of South East England.

The NFS comprises a collection of documents that includes the 4th June 1941 Agricultural Census Return (AC), Supplementary Agricultural Census Returns, the Primary Record (PR) and large scale Ordnance Survey Maps annotated with farm boundaries. Section F of the PR includes data about whole or part fields that the Ministry of Agriculture and Food (MAF) had directed should be ploughed-up and re-sown to one or more crops. These entries include the OS field numbers thus enabling the text to be connected with an individual field, although in cases where ploughing-up was directed on part of a field, the specific area was not identified. Spatial and attribute data were captured from the AC and PR documents and farm boundaries were digitised from georeferenced digital photographic images of the OS maps. A database of 514 farms with complete attribute, address point grid references and area polygons was created. This agricultural geoinformation was combined with three other sources of geospatial data: the fivefold agricultural land classification, the British Geological Survey maps of surface and bedrock geology and the LIDAR 2m 3D digital terrain model.

### **3. Results and Analysis**

The results from the analysis of these data sources are examined in respect of two main research questions:

- what was the extent and impact of the plough-up campaigns on the agricultural landscape of the South Downs?
- were factors such as engagement in plough-up campaign, farm size, elevation and aspect, length of occupancy and presence of motive power at the time of WWII, influential in determining whether a farm family remained in occupation on a farm during the post war decades?

Overall 36 single crop types and 38 combinations of two, three, four or even five crops types in a field were recorded in the combined plough-up data for 1940 and 1941 (there was no plough-up land on the study farms in 1942): most of these occurred with only limited frequency. The most common single crop types respectively in 1940 and 1941 were oats (35% and 34%), wheat (22% and 17%) and barley (5% in both years). In cases where the area of the crop sown was recorded (mainly in West Sussex) this was in the 4.0-19.9 ha range, which accounted for 75% the field area or in many cases the whole field. Some farmers engaged fully with the plough-up campaigns re-sowing in excess of 50 ha in 1940 and 70 ha in 1941, although on the majority of farms less than 25% of their land was entered into the plough-up campaign. Estimating the area of cereals in the pre-war, 1939, harvest by subtracting the areas re-sown to cereals indicates 53% and 47% increases in area in East and West respectively. Examination of the ploughed-up fields in relation to the agricultural land classification reveals that those in the poorer classes (4 and 5) were more likely than those of the better quality to have been direct for ploughing-up. The underlying bedrock of 75% of the parish area comprises various chalk formations, although some parishes extend northwards over Gault Clay and Lower/Upper Greensand. A higher proportion of the area of ploughed-up land was over chalk compared with overall and the percentages on the other types were correspondingly lower, notably over Gault Clay.

### **4. Conclusion**

The results of this analysis question the “locally held view that the Downs were transformed quite radically to an arable monoculture during the Second World War” (Short et al. 2000: 219). The geographical range of plough-up land stretched across the study area from Beachy Head in the east to the border with Hampshire in the west, although it amounted to only some 6% of all farmland within the 78 parishes. The ploughed-up land nearly doubled the amount of cereal cropping in the area compared with the estimated total in 1939 and 43% of the farms sowed plough-up to cereals. The

research contributed to the growing body of research employing GIS as an organising framework for managing and integrating geospatial data from a number of historical data sources and using the analytical tools and techniques available within such software for casting new light on old questions. The conversion and capture of historical data from different formats, including maps, text, photographs and numerical attributes, is a feature of this endeavour, but is not unproblematic. While the ability to envision historical landscapes and environments is undoubtedly a laudable achievement in its own right, potentially greater rewards are to be obtained by seeking to understand the operation of cyclical and linear nature of historical processes. The First and Second World Wars have been interpreted as the 'forcing house' of change during the 20th century, but this paper suggests that at least in so far the development of a more intensive agricultural landscape on the South Downs is concerned, the plough-up campaign of WWII had variable impact.

## 5. Acknowledgements

A Small Research Grant from the British Academy helped to initiate research tracing the occupants of farms on the South Downs during the post World War II decades. The work reported here is materially different from the original research, but nevertheless developed from the idea of linking historical data sources to examine agricultural landscape and occupancy changes.

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## Biography

Nigel Walford, Professor of Applied GIS at Kingston University and Director of the Centre for Earth and Environmental Science Research, focuses on applying GIS to the mapping and analysis of geodemographic and agri-environmental information. Recent journal papers are published in **L.J. of GIS, Env. & Planning A**, and **Population, Space and Place**.