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HUMAN IMPACT ON THE VEGETATION OF BORY TUCHOLSKIE
ON THE BASIS OF PALYNOLOGICAL INVESTIGATIONS

INTRODUCTION

The investigations presented in this paper began in 1982 as part of the interdisciplinary programme R-III-15 „Ecological processes within selected landscape units and their energy balance” supervised by Prof. Ryszard Bohr from the Institute of Biology Nicolaus Copernicus University in Toruń. Since 1986 the investigations have been continued as central programme 04.10.01 entitled „Natural foundations of the protection and formation of the natural environment”.

The palaeoecological investigations were concentrated to the Lake Wielkie Gacno area and performed by Dr M. Hjel m r o o s - E r i c s s o n (1981, 1982) of Lund University. The aim of our expanded palaeoecological investigations was to deepen the knowledge about the history of vegetation in this area. Special attention was paid to the role of man and his interference with the primary vegetation. A more complete presentation of the research results have been published in a doctoral thesis by G. M i o t k - S z p i g a n o w i c z (1988). This paper is a brief summary of results related to the human impact and the settlement economy of this area.

INVESTIGATION AREA

We decided to choose for our investigations two lakes situated in ancient drainage valleys (Lake Suszek and Lake Kęsowo) and one small kettle hole (Lake Mały Suszek). Lake Suszek and Lake Mały Suszek are situated in the central, forested part of Bory Tucholskie and Lake Kęsowo – southwest of the present forest border. Besides these palaeoecological sites the Lake Wielkie Gacno (Hjel m r o o s - E r i c s s o n 1981, 1982) was used as a fourth site (Fig. 1).

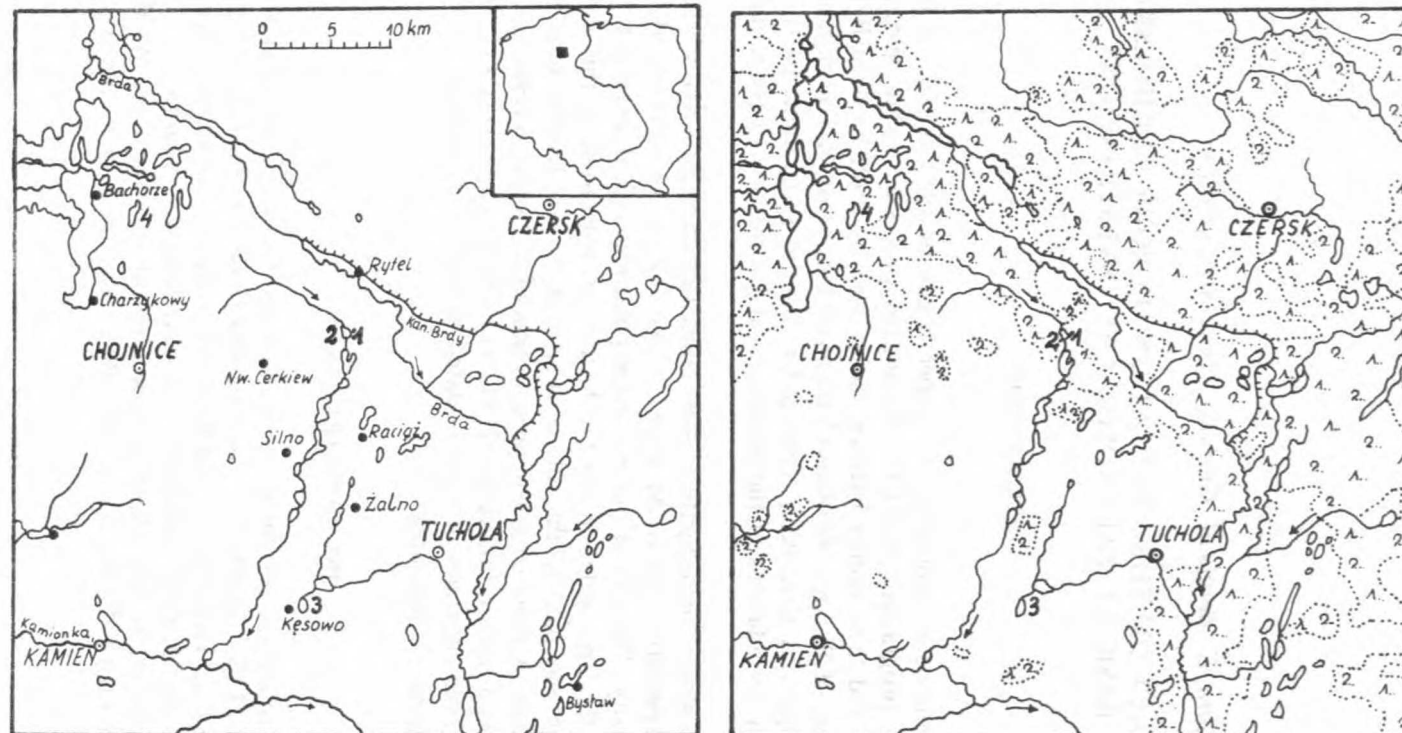


Fig. 1. Maps of the Bory Tucholskie region. The site map (above) with reference lakes indicated (1 – Mały Suszek, 2 – Suszek, 3 – Kęsowo, 4 – Wielkie Gacno), the forest map (below) with forest and open land indicated

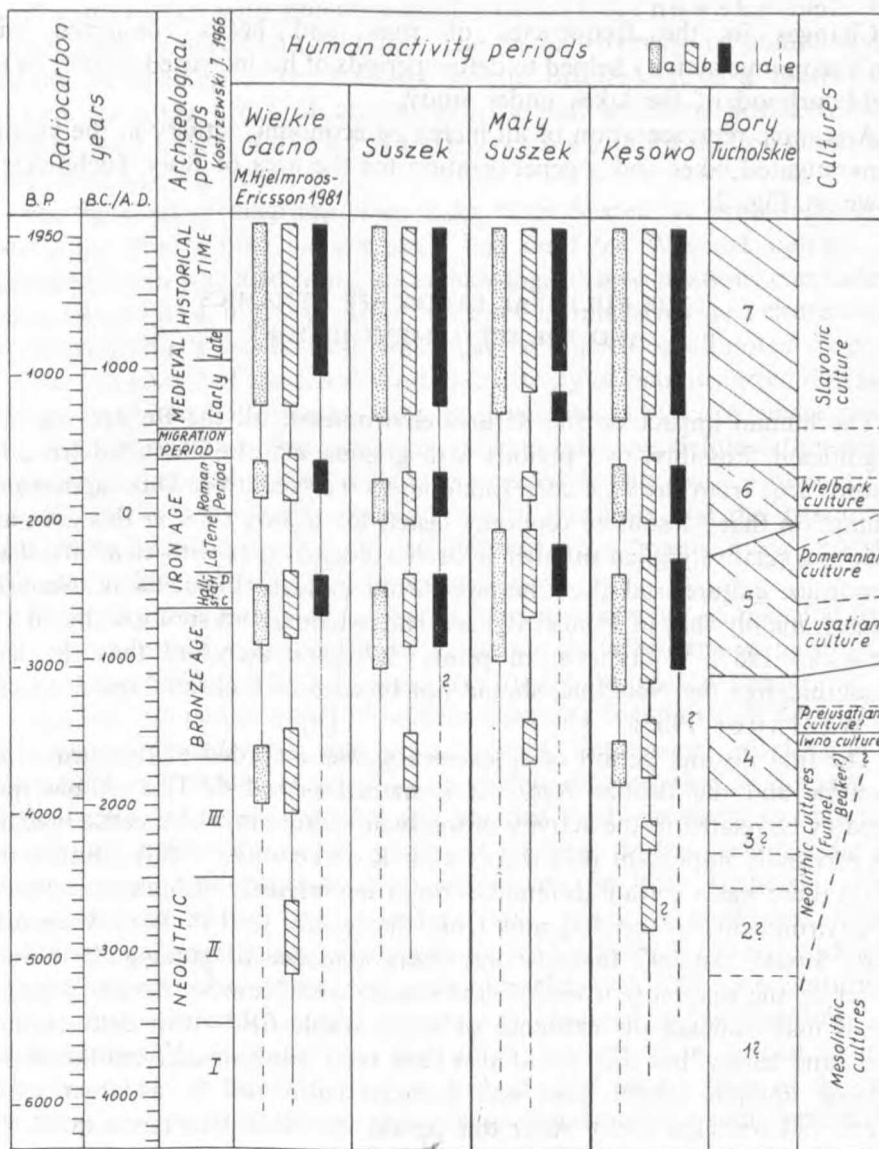


Fig. 2. Correlation of human activity periods in Bory Tucholskie (a – clearings, b – grazing, c – cultivation, d – weak impact, e – very weak impact)

METHODS

Changes in the frequencies of trees and herbs connected with man's economic activity helped to define periods of his increased activity in the neighbourhood of the lakes under study.

A graphic representation of an increased economic activity in the vicinity of investigated lakes and a generalization for the area of Bory Tucholskie is shown in Fig. 2.

THE CULTURAL LANDSCAPE DYNAMICS
AND THE SETTLEMENT HISTORY

The human impact on the natural environment till the Bronze Age was insignificant. Possibly, two periods with grazing may be identified from the Kęsowo area from the time corresponding to the Neolithic. This supports the assumption that Mesolithic economy lasted for a long time in this area and explains a relatively great number of archaeological sites with elements of the Komornice culture and the Chojnice-Pieńki culture. Elements of Neolithic cultures, mainly that of Funnel Beakers, are encountered sporadically (Bagniewski 1987; Walenta, in print). It seems therefore that the term Mesolithic, like the Neolithic, should not be used as a chronological concept (cf. Welinder 1985).

The first distinct period of stock-raising was recorded at the turn of the Neolithic and the Bronze Age – it is named period 4. This should most probably be related to the activity of the Iwno culture in which cattle breeding was especially important (Godłowski, Kozłowski 1985). During that period there was a certain differentiation in the intensity of human impact on the environment. In the diagrams from the central part of Bory Tucholskie (Mały Suszek, Suszek) there is only weak evidence of grazing. It is much clearer in the diagrams from Wielkie Gacno and Kęsowo. Single grains of cereals may indicate the existence of small arable fields with cultivation of wheat and barley, but they could also have been transported from the nearby marine uplands where land was perhaps cultivated to a larger extent (Grzelakowska 1989). After this period the forest was regenerated with a slightly changed species composition.

The 5th period of intensified economic activity is connected with the development of the Lusatian culture which, in the course of time, was transformed into the Pomeranian culture (Godłowski, Kozłowski 1985). Results of the pollen analyses indicate that the economic activity of

human groups consisted mainly in husbandry. Farming connected with the cultivation of barley and wheat also developed, especially during the Pomeranian culture, although to a small extent. The results of the pollen analysis show great convergence with archaeological results (Klichowska 1962, 1968; Łuka 1966; Kmiecinski 1968). The distinct increase of human activity causing an opening of the landscape in late Bronze Age is a characteristic pattern for large areas of central Europe and southern Scandinavia (cf. Dąbrowski 1981; Ralska-Jasiewiczowa in Pawlikowski et al. 1981; Berglund 1988).

On the basis of diagrams from Lake Mały Suszek we can conclude that locally the Pomeranian culture could last until the Wielbark culture. This settlement span was also found in archaeological investigations conducted in Leśno (Walent, in print). After the period of intensive forest clearances the landscape partially regenerated, which can be noticed on all pollen diagrams.

The 6th period of increased economic activity of man occurred during the Roman period and is connected with the development of the Wielbark culture. The changes on the pollen diagrams indicate intensive deforestation and an intensive development of settlement connected mainly with husbandry and thereby with a considerable development of meadows and dry pastures. In addition to husbandry cultivation of different crops became more important. Rye was cultivated from now onwards.

Following this period of intensified economic activity of man the forests are regenerated. This regression of economy, described for many areas (cf. Berglund 1969, 1988) is connected with the Migration Period.

The last, 7th period of man's economic activity began in early Middle Ages and has continued until the present times. Settlement, developing very intensively, contributed to an almost complete deforestation of the area. The intensification of forest clearance was justified by the necessity to obtain new areas to be turned into arable lands and pastures. In the early Middle Ages husbandry was still the basic form of economy in Bory Tucholskie. In the cultivation rye played the dominant role, which is confirmed also by archaeological investigations (Grzelakowska 1989; Kowalczyk 1986). Apart from rye also wheat was grown. In the 12th and 13th centuries an increase in the intensity of the economy is observed in all diagrams.

Summing up, we must state that all the periods of intensified economic activity of man in Bory Tucholskie, distinguished on the basis of the pollen analyses, are comparable with archaeological data on the settlement history.

We are grateful for the possibilities to take part in the stimulating collaboration between ecologists, geographers, geologists and archaeologists within the framework of the projects initiated and conducted by the late professor Ryszard Bohr. We express our gratitude to many colleagues at the

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REFERENCES

- Bagniewski Z., 1987, *Mezolityczne społeczności myśliwsko-rybackie południowej części Pojezierza Kaszubskiego*, „Acta Universitatis Wroclaviensis”, nr 901, *Studia Archeologiczne*, t. 17.
- Berglund B. E., 1969, *Vegetation and human influence in South Scandinavia during Prehistoric time*, „Oikos” Suppl., vol. 12, p. 9–28.
- Berglund B. E., 1988, *The Cultural Landscape during 6000 Years in South Sweden – An Interdisciplinary Project*, [in:] *The Cultural Landscape – Past, Present and Future*, eds. H. H. Birks, H. J. B. Birks, P. E. Kaland, D. Moe, Cambridge Univ. Press, p. 241–254.
- Dąbrowski J. (ed.), 1981, *Woryty – studium archeologiczno-przyrodnicze zespołu osadniczego kultury lużyckiej*, Wrocław.
- Godłowski K., Kozłowski J., 1985, *Historia starożytna ziem polskich*, Warszawa.
- Grzelakowska E., 1989, *Środowiskowe uwarunkowania osadnictwa pradziejowego i wczesnośredniowiecznego w północnej części Borów Tucholskich*, „Acta Universitatis Lodzianensis” 1989, *Folia archaeologica*, z. 11.
- Hjelmroos-Ericsson M., 1981, *The post-glacial development of Lake Wielkie Gacno, NW Poland. The human impact on the vegetation – recorded by means of pollen analysis and C¹⁴ dating*, „Acta Palaeobotanica” vol. 22, no. 2, p. 129–144.
- Hjelmroos-Ericsson M., 1982, *The holocene development of Lake Wielkie Gacno NW Poland. A palaeoecological study (Preliminary results)*, „Acta Palaeobotanica”, vol. 22, no. 1, p. 23–46.
- Klichowska M., 1962, *Odciski zbóż i roślin strączkowych na ceramice kultury pomorskiej*, „Przegląd Archeologiczny”, t. 14, p. 142–152.
- Klichowska M., 1968, *Znaleziska zbóż na terenie ziem polskich od neolitu do XII w. n.e.*, „Kwartalnik Historyczny Kultury Materialnej”, t. 4, p. 678–679.
- Kmiecinski J., 1968, *O sposobach ustalania chronologii prahistorycznej orki w Odrach w pow. chojnickim*, „Acta Archaeologica Lodzianensis”, nr 17, p. 73–76.
- Kostrzewski J., 1966, *Pradzieje Pomorza*, Wrocław.
- Kowalczyk M., 1986, *Raciąż – średniowieczny gród i kasztelania na Pomorzu w świetle źródeł archeologicznych i pisanych*, „Archaeologia Baltica”, vol. 6.
- Łuka L. J., 1966, *Kultura wschodniopomorska na Pomorzu Gdańskim*, Wrocław, 45–46.
- Miotk-Szpignatowicz, G., 1988, *The history of the vegetation of Bory Tucholskie and the role of man in the light of palinological investigations*, Gdańsk, manuscript.
- Pawlikowski M., et al., 1982, *Woryty near Gietrzwałd, Olsztyn Lake District, NE Poland – vegetational history and lake development during the last 12000 years*, „Acta Palaeobotanica”, vol. 22, no. 1, p. 85–116.
- Walenta K., in print, *The Leśno settlement complex against the background of the Bruska Island settlement microregion*, „Archaeologia Interregionalis UJ”.
- Welinder S., 1985, *Comments on Early Agriculture in Scandinavia*, *Norw. Arch. Rev.*, vol. 18, no. 1–2, p. 94–96.

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WPLYW OSADNICTWA LUDZKIEGO NA ROŚLINNOŚĆ BORÓW TUCHOLSKICH NA PODSTAWIE BADAŃ PALINOLOGICZNYCH

Prace nad tą tematyką prowadzono w ramach programu R-III-15 „Procesy ekologiczne wewnątrz wybranych jednostek krajobrazowych i ich bilans energetyczny”, kierowanego przez prof. Ryszarda Bohra z Instytutu Biologii UMK w Toruniu, a od 1986 r. kontynuowano w centralnym programie 04.10.01.

W powyższych badaniach uczestniczą szwedzcy i polscy specjaliści. Analizami objęto kilka jezior na terenie Borów Tucholskich: Suszek, Mały Suszek, Kęsowo. Wyniki korelowano z wszechstronnym opracowaniem osadów jeziora Wielkie Gacno, opublikowanym w 1981 r. przez M. Hjelmoos-Ericsson. W obecnie analizowanych osadach nieco słabiej niż w Wielkim Gacnie wyróżniają się pierwsze trzy fazy ożywionego osadnictwa. Przypuszczalnie fazę drugą i trzecią można łączyć z działalnością społeczności neolitycznych, prawdopodobnie kultury pucharów lejkowatych. Intensywniejsze zmiany szaty roślinnej przypisano działalności grup ludzkich wczesnych faz epoki brązu i łączono z wyróżnianymi archeologicznymi pozostałościami charakterystycznymi dla kultury iwińskiej (ewentualnie też – mniej licznymi – kultury przedłużyckiej). Po zaobserwowanej przerwie w intensywnym wykorzystywaniu środowiska kolejną fazę osadniczą można łączyć z gospodarką ludności z cyklu łużycko-pomorskiego. W odpowiadających jej poziomach pyłkowych, prócz roślin świadczących o stosowaniu hodowli zwierząt, występują pyłki zbóż potwierdzające uprawę roli. Wymienione typy gospodarki: hodowla zwierząt i uprawa roli od tego okresu stale potwierdzane są przez wskaźniki roślinne, choć zmienia się ich natężenie. Faza szósta wzmózonej intensywności osadniczej łączona jest z działalnością ludności kultury wielbarskiej, natomiast siódma odpowiada czasowo trwaniu osadnictwa wczesnośredniowiecznego i okresów następnych. Poczynając od wczesnego średniowiecza w spektrach pyłkowych rośliny wskaźnikowe nieprzerwanie odzwierciedlają gospodarczą działalność grup ludzkich na terenie Borów Tucholskich.