Geocaching – A harmless recreational activity of digital natives or a threat for forest conservation? Case studies from Bavaria

Gerd Lupp, Chair for Strategic Landscape Planning and Management, Technical University of Munich, GermanY, gerd.lupp@tum.de luppg@gmx.de

Martina Brockard, Technical University of Munich, Germany

Markus Melber, Bat Foundation, Erfurt, Germany

Valerie Kantelberg, Bavarian State Institute of Forestry, Freising, Germany

Stephan Pauleit, Chair for Strategic Landscape Planning and Management, Technical University of Munich, Germany

What is Geocaching?

Geocaching is an outdoor game using the internet and a GPS to seek small containers called "(geo)cache", that have been hidden by players of the game. These small hidden boxes contain a logbook and "treasures", items of modest monetary value for trading and exchanging. Players finding the cache enter the date when it was found and sign the booklet with their code name and a comment in the logbook. Coordinates of the hidden caches are posted on the internet such as geocaching.com. There are also items that are supposed to move from cache to cache to reach a certain place, so-called "Travelbugs" or "Travelcoins". Their moves are also logged and can be followed online (Groundspeak 2014). In 2014, around 343,000 active German Geocachers were registered on the most popular geocaching.com platform, and around 327,000 caches were available (Project Geocaching 2014), so there is approximately almost one cache per square kilometer on average in Germany.

Forest managers in Bavaria often had no idea about this activity until hunters and other stakeholders like nature conservationists complained about persons sneaking around in the forest at unusual times behaving in a strange manner (Käufer 2014), disturbing wildlife and habitats such as tree cavities. In interviews carried out in urban proximate woodlands (Lupp et al. 2016), about only one out of 300 interviewees indicated geocaching as a reason for their visit to the forest. However, geocachers may not always admit their activity when interviewed because the cache should be hidden from "Muggels".

Material and methods

The Forstenrieder Park and Forst Kasten, a 5,000 ha urban woodland in the south of Munich was selected as a study area. In 2014, around 60 geocaches were listed in Geocaching.com for this area. 21 of them were assessed in detail using based on successful logs of the caches. Using the logbook, the frequentation of the caches can be assessed this way. To detect possible conflicts with conservation issues, a catalogue of criteria and indicators was developed (Table 1). The selected caches were visited on-site and indicators were documented, considering overall disturbance, disturbance of biodiversity, especially nesting birds and bats, as well as interference with wildlife and its management.

Table 1. Extract from the criteria set to assess potential impacts of geocaching, Brockard 2014, simplified

Criteria	Indicator	Assessment
Potential disturbance by searching for geocache	Log numbers	· Number of logs since 2010 both on geocaching.com and logbooks in caches
	search time	· Interpretation of comments in the logs · Own search time for the cache
	Distance to public trails	· Distance between cache and marked trail or forest road
Potential impacts on biodiversity	Placed in a protected area away from marked trails	· Comparing coordinate with data of protected areas and evaluation at the cache
	Traces of Trampling	· Width and length of cacher trails
	Vegetation losses at hides	· Analysis of visible vegetation losses and species
	Nearby habitats and resting places of birds and bats	· Habitat structures for birds and bats around the cache and along cacher trail
Potential impacts on wildlife and hunting	Quiet zones for game	· Habitat structures suitable as prime locations for game around cache
	Game feeding and hunting constructions	· Hunting constructions visible from cache and cacher trail
Potential conflicts with other recreationists	Distance to recreation hotspots	· Distance between hide and recreation hotspots · Own searching time at recreation hotspots

Results

Each of these analyzed caches was logged between 0.12 and 0.55 times per day on average (Brockard 2014). Besides trampling disturbance of vegetation around the hide, most of the assessed caches in the Forstenrieder Park seem to cause little to moderate interference with wildlife and conservation issues (Brockard 2014), though the assessment of potential habitats was conducted in summer, and not all of the potential habitats, such as cavities, can be detected when trees are foliated. However, the peak of the geocaching activities is in spring and correlates with the breeding and nesting time of almost all bird species. For example, the medium impact geocache 'Smaragdpfad' ('Emerald-Trail') was logged in on average around 4 times per month between November and February, and 11-12 times per month in the nesting and breeding months of April, May, June and July.

Negative example Guttenberger Wald in Würzburg

Over the years, also more challenging geocaches requiring climbing equipment gained increased popularity. In forests, those caches are hidden in the canopy of the trees. Notably, bats staying in a day-roost inside tree cavities or under loose bark can be seriously disturbed, even if they are not directly threatened (Kerth et al. 2006).

Guttenberger Wald is a deciduous forest dominated by old beech (*Fagus sylvatica*) and oak (*Quercus robur*) forests in the vicinity of Würzburg. A number of deadwood trees provides shelter and roosts especially for bats and is a Natura 2000 site. In late 2012, a series of nine climbing caches was detected on the Geocaching.com platform. All of them were placed within a home range of Bechstein Bat (*Myotis bechsteinii*). Unmistakable traces like trampling, ripped off branches and geocaching containers in the canopy were detected. All nine caches had been logged 0.64 times per day on average. Bat conservationists and forest authorities tried to contact the cache owner and the reviewer (a voluntary person supervising placement and description of caches before they are posted). It took 14 days until the caches were delisted and removed.

Conclusions

Although so-called reviewers permit caches to be listed on the caching platforms, this review system has a number of deficits. Only a few guidelines and simple sets of criteria exist and they do not provide explicit information about the suitability of certain sites for placing geocaches. Spatial information for suitable and unsuitable sites as well as training opportunities for reviewers would seem to be appropriate approaches to minimizing conflicts with forest conservation issues.

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