

Habitats associated with woody vegetation on golf courses in urban and periurban areas in Ireland

Mary Forrest, Eamon Kealy and Alan Hunter
UCD School of Biology and Environmental Science,
Agriculture and Food Science Centre,
University College Dublin, Belfield, Dublin 4, Ireland.
Corresponding author mary.forrest@ucd.ie

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Abstract:

Golf is an important leisure activity in Ireland encompassing some 400 courses covering 30,000 hectares with 320,000 club members. Approximately 50 to 60 ha of the land per golf course are classified as primary, secondary and deep rough or out of play areas in addition to a substantial area on the fairways which is also available for tree and shrub planting. Although, parkland style designed courses predominate and are centred in both rural and urban areas, Ireland is famous for its links. This study examined the range and frequency of habitat types on two golf courses according to the method of Fossitt, (2000). Elm Park, an 18 hole parkland course in a suburban location in Dublin, Ireland was founded in 1924 in existing parkland with a range of non native trees species. It is surrounded by residential housing, apartment blocks, office blocks, a hospital and roads. Rockmount Golf Club Carryduff, Co. Down, Northern Ireland is situated 13 kilometres south of Belfast city centre. This 18 hole parkland course was built on agricultural land and completed in 1995, taking full advantage of the natural landscape.

Ten habitat types were recorded on tees, greens, fairways and out of play areas. Amenity Grassland was the most frequent (8), with scattered trees and parkland (6) hedgerows (4) and treelines (2) contributing to the woody vegetation on the courses. An examination of trees in these habitats indicated that native species occurred more frequently than introduced species at Rockmount, whilst there were equal numbers of native and introduced species on the older Elm Park. Notwithstanding this, the mean number of native Irish tree species planted on both golf courses is less than four. Habitats on both golf courses were disjointed and separated by greens, fairways and tees. The potential for development of habitats such as scattered trees and parkland and mixed broadleaved woodlands is least around the greens and greatest adjacent to both the fairways and out of play areas. Given that native trees have a greater potential to support biodiversity compared to non-native trees, a major opportunity exists to create native species woodlands to increase tree and ecological diversity together with increasing the emphasis on sustainable golf course ecology and management in urban and periurban areas. Other habitats recorded on both courses included rivers and lakes, earth banks and stone walls.

Introduction

Golf is an important leisure activity in Ireland with circa 425 courses. Total membership of golf clubs is estimated at 325,000 with approximately 5,000 directly employed in the management of these courses. At least 50 to 60 ha of land per golf course have the potential to be used for the development of natural and native habitats. Additionally, a substantial area on the fairways of each course is also available for tree and shrub planting together with habitat development.

While ten percent are links courses located on sand dunes on in coastal areas, the remainder are parkland courses centered in rural and urban areas. Since the 1880's some 61 courses were constructed in the Dublin area.

Golf courses across Ireland contain a wide variety of habitats with the frequency of these habitats often dependent on golf course location and size. Yasuda and Koike (2006) suggested that golf courses in comparison to urbanised areas can be a refuge for both flora and fauna. This indicates that golf courses and their habitats have a vital role to play in wildlife preservation. Sorace and Visentin (2007) demonstrated that golf courses contribute to wildlife conservation by increasing forest cover and the amount of natural areas together with decreasing turfgrass cover. By creating habitats that support increased levels of wildlife, they can sustain wildlife communities that would otherwise not occur in the surrounding turfgrass areas. Priority type habitats on golf courses can include mixed broadleaved woodland, scrub, hedgerows, lakes, ponds, rivers wetland, and old stone walls. According to Fahrig (1997) conservation efforts should revolve around the prevention of habitat loss and ultimately towards habitat restoration. Joyce (1998) stated that golf courses are "no substitute for wilderness", however; there is considerable potential for golf courses and their habitats to become the last wildlife refuges in urban areas. Habitat classification is an important feature of any study as it can highlight habitats that are absent and those that can be changed. In this paper a report is given on the habitats in two golf courses; a mature course in suburban Dublin and a recently constructed site in periurban Belfast.

Materials and Methods

This study examined the range and frequency of twelve habitat types on two golf courses in an urban and periurban area. Habitats on each area of the golf course were classified using the criteria developed by Fossitt (2000). Habitat classification was used to classify areas on each golf courses and allow for comparison with other golf courses. The following habitats (from Fossitt 2000), are applicable to golf courses and can be classified as follows: Improved agricultural grassland (GA1); Amenity Grassland (GA2); Dry Meadows and Grassy Verges (GS2), Wet Grassland(GS4); Mixed Broadleaved Woodland (WD1) Scattered Trees and Parkland (WD5); Scattered Trees and Parkland (WD5); Scrub (WS1) Hedgerows (WL1); Treelines (WL2); Depositing/Lowland Rivers (FW2); Artificial Lakes and Ponds (FL8); Earth Banks (BL2) and Stone Walls (BL1). This study was undertaken in 2005 and 2006.

Each golf course was divided into the four most important areas where habitats are found - tees, fairways, adjacent to greens and out of play areas. The selection process was deliberate, choosing a tee, fairway, green and out of play area that best represented the golf course as a whole and allowed for as much evaluation as possible. The golf courses selected were Elm Park (founded in 1924) and situated at Nutley House, Nutley Lane, Donnybrook, Dublin 4. This is a mature parkland golf course with a variety of habitats and tree species. Residential housing and an hospital adjoin it. In 2002, Patrick Merrion Golf Architects re constructed the greens according to the United States Golf Association (USGA) specification. Rockmount Golf Club is located in Carryduff, Co. Down, situated less than 13 kilometres south of Belfast. The course is an 18 hole, par 72 [6,372 yards (5827 metres)] parkland course built on former agricultural land. The course was designed to take full advantage of the land's natural elements and in particular, attention was paid to minimise earth moving during its construction. The course was opened in May 1996. This course was selected because of its recent construction.

Results and Discussion

In total ten habitat types were recorded (Figure 1) with Amenity Grassland the most frequent (8). Scattered trees and parkland (6) Hedgerows (4) and Treelines (2) contributed to the woody vegetation on the courses.

The distribution variation of habitats between greens, fairways, tees and out of play areas highlights the areas of the golf courses studied which are limited in habitats (Figure 2). For example, the variation between the second green at Elm Park (five habitats) (amenity grassland, scattered trees and parkland, stone walls, earth banks, water courses) and the out of play area at the fourth hole at Elm Park where only two habitats are present (amenity grassland and scattered trees and parkland) is shown. Rockmount were good examples of courses where the original landscape had been modified beneficially to increase habitat types, in comparison with previous land use. In Elm Park, the oldest golf course studied; there were many examples of how previous plantings had restricted potential future habitat creation, the 2nd green and the 5th fairway being examples of this. The existing trees around the 2nd green either stand alone or are located in small groups/clusters adding very little in terms of viable habitat. The potential for further planting around the green is limited due to the restricted space available, as golf greens require good air circulation and sufficient space for golfers. There is little scope for connecting the trees at the 5th fairway in Rockmount, as this would inhibit recovery shots back onto the adjacent fairway. This highlights the limitations that the game of golf poses when creating large continuous habitats, unlike planting in non-sporting locations.

On golf courses, heavily maintained areas of turfgrass can act as barriers between patches of habitats along both sides of the fairway because of the lack of vegetative cover. Unsurprisingly, amenity grassland (GA2) occurred most frequently, on all 8 holes studied. Superintendents should focus on developing a greater diversity of habitats on their courses by reducing the total coverage of amenity grassland. At Rockmount there are examples of hedgerows that are losing shape. According to Foulkes and Murray (2005) this type of hedge is commonplace in Ireland and is referred to as “overgrown” and losing structure. Management of existing habitats is important to retain their viability. The 6th tee at Rockmount is an example of a tee that has many habitat types, 6 in total. The habitats are small in relation to out of bounds areas, but they create diversity on the golf course.

Conclusion

In Elm Park, the oldest golf course studied; there were many examples of how previous plantings had restricted potential future habitat creation. The 2nd green and the 5th fairway were examples of this. With foresight, new golf courses in the design process could plan for future expansion and development of diverse yet sustainable habitats. The potential for development of habitats is least around greens and greatest in out of bounds areas where woodland can be planted.

While habitat diversity may be low in out of bounds areas on the golf course, continuous homogenous habitats can be created such as broadleaved woodland, which is impossible on greens, fairways and tees. With proper design and management of such habitats golf courses can increasingly become refuges for wildlife in continuously expanding urban areas.

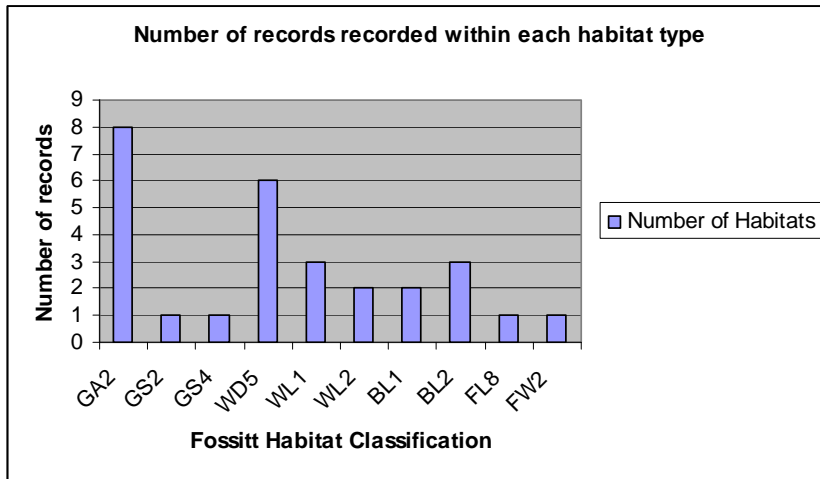


Figure 1. The total number of records for each of ten habitats found on 16 golf holes. ($P \leq 0.05$)

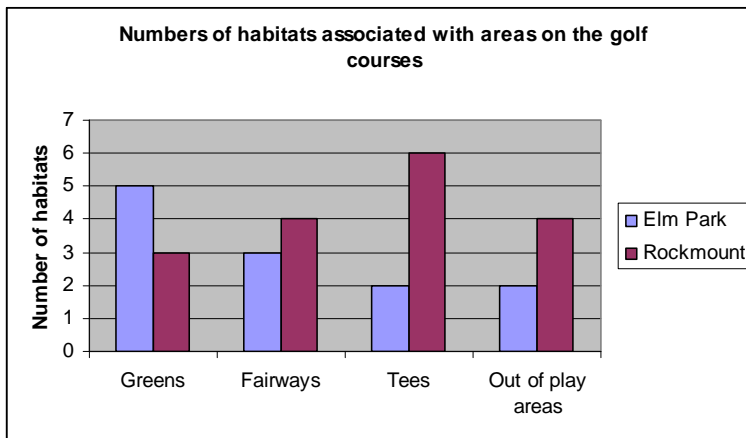


Figure 2. The numbers of habitats found on the greens, fairways, tees and out of play areas studied at two golf courses ($P \leq 0.05$)

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