Silver Gulls: urban waste creates flying problems

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ABSTRACT

The Silver Gull population in the Greater Melbourne Area has expanded dramatically in response to the availability of abundant anthropogenic foods. The activities of large numbers of gulls lead to a range of conflicts with human interests. These conflicts and examples of their economic costs are described and strategies for their mitigation are discussed.

Key words: Silver Gull, population increase, urban waste, human-wildlife conflict, economic impacts.

Introduction

Few Australians would be unfamiliar with the Silver Gull *Larus novaehollandiae*, more often known as the seagull, and its habit of attending humans with food, watchful for any opportunity to cadge or steal scraps, or simply waiting for the seemingly inevitable handouts. *L. novaehollandiae* occurs not only around the coast of Australia, but may be seen far inland on lakes and wetlands or around inland towns. It may breed in any month of the year in Melbourne and Sydney, where its population has expanded dramatically, but in many areas it is a seasonal breeder. Individual birds may move long distances, the longest recorded movement of a bird banded as a chick being 3256 km. Young birds frequently move several hundred kilometres from the breeding site but often return to breed at the natal site (Higgins and Davies 1996). *L. novaehollandiae* naturally exploits a wide range of food resources, feeding along shorelines, catching fish and other marine organisms near the surface of the water, hawking for insects over land or near lights, foraging behind ploughs and in short-grassed areas (Higgins and Davies 1996).

The opportunistic behaviour of *L. novaehollandiae* is common to many gull species and has enabled *L. novaehollandiae* and related species around the world to become superabundant as a result of access to anthropogenic foods (Harris 1970; Blokpoel and Spaans 1991; Spaans and Blokpoel 1991; Vermeer *et al.* 1991; Thibault *et al.* 1996; Viksne *et al.* 1996; Belant 1997; Raven and Coulson 1997). While *L. novaehollandiae* commonly obtains food directly from humans, indirect feeding by allowing gulls access to major food sources, such as at rubbish tips, is likely to be a more significant contribution to the increasing population (pers. obs., Anderson 1988; Meathrel *et al.* 1991; Smith and Carlile 1993a). My own observations over some 40 years suggest that the nature of refuse at rubbish tips has changed in several ways. It seems highly significant that there was very little putrescible material (food waste) disposed of at rubbish tips during the late 1950s and early 1960s, at least at the rubbish tips of Melbourne that I was familiar with. At that time, Australian society was less affluent than now, and little food was wasted in many households. Often, leftover food was used in subsequent meals. In addition, food waste from commercial and industrial sources frequently went to piggeries, rather than to rubbish tips. Coincident with the increase in the human population over this forty-year period have been regulatory and societal changes, such that now public health requirements no longer permit food waste to be used at piggeries, and large amounts of food scraps are discarded from private homes. Most of this material goes to rubbish tips. Similar changes in affluence leading to increased food waste at rubbish tips in Great Britain were considered by Horton *et al.* (1983) to be likely to lead to aggravation of the problems caused by the five species of gulls that fed at the rubbish tips they studied.

Not surprisingly, *L. novaehollandiae* has been quick to exploit this largesse and its burgeoning population is a direct consequence of such an abundant food source. For example, on Mud Island in Port Phillip Bay, five pairs of gulls were recorded breeding in 1959. By the mid 1980s, 50 – 70 000 pairs bred there (unpubl. data). Many problems are now caused simply because *L. novaehollandiae* is so abundant. This paper describes some of the problems that have been identified during an ongoing study of the economic costs of problems caused by *L. novaehollandiae* in the Greater Melbourne area (Figure 1).

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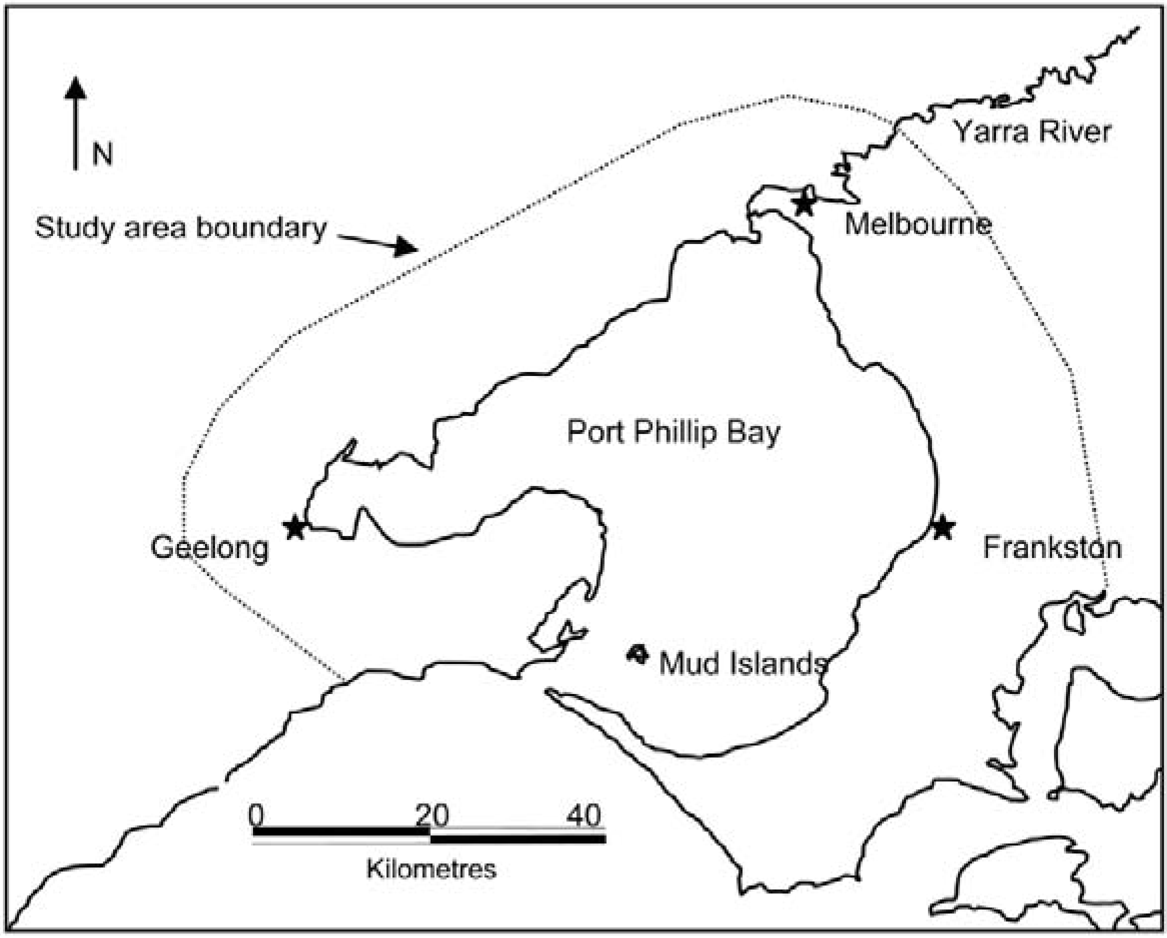

Figure 1. Map showing Melbourne and study area boundary

Methods

Several approaches were used to discover where problems were being caused by *L. novaehollandiae*. Initially, in 1998, I sent letters to all Melbourne municipalities within about 10 km of the coastline of Port Phillip Bay, to pest control companies, bird watching groups, rubbish tip managers and marina managers, asking whether they experienced, or were aware of, situations where *L. novaehollandiae* caused problems. The records of the Department of Natural Resources and Environment were searched for details of permits issued for the removal of *L. novaehollandiae* nests and eggs. I visited sites where respondents indicated that there were problems being caused and I recorded the nature of the problems and their costs during face-to-face interviews with relevant personnel at those sites. A standard questionnaire developed for this study was used for each interview. The questionnaire sought information on the nature of problems caused; numbers of gulls present and changes in numbers over the past 10 years; the costs of damage, maintenance and gull control; methods used to address the problems and their effectiveness; and the nature of the business or operation. During some of these visits I learned of other sites where gulls were causing problems. Systematic searching in the vicinity of known problem areas revealed several further sites. This led to interviews with staff at these new sites.

Table 1. Examples of locations and problems caused by Silver Gulls

Location (number of occurrences)	Examples of specific problems and number of occurrences						
	Corrosion	Blockage of drains	Aircraft hazard	Fouling	Noise	Legal costs	OH&S issues
Nest on roofs, boats, tanks and other artificial sites (78)	78	70		78	20		65
Roost on roofs (10)	9	10		10	5		4
Roost/bathe at public swimming pools (4)	4	4		4	1		
Roost at marinas (2)	2			2			2
Roost, bathe at airports (3)			3			2	3
Roost on greenhouse roofs (1)				1		1	
Feed at rubbish tips (3)						3	1
Roost at golf course (1)			1	1			

Results

There is a wide range of impacts on human interests resulting from the elevated *L. novaehollandiae* population in urban areas of Melbourne. Table 1 shows situations where problems have been identified and indicates the nature of those problems.

In many of these cases, cleaning, painting and deterrent measures were undertaken to reduce the impact of the problems caused. For example, where *L. novaehollandiae* is nesting on bulk storage tanks that have to be inspected frequently, there is a potential slip hazard from faeces on the tanks, and aggressive swooping by nesting gulls means that two staff have to undertake inspections that would normally require only one person, at an additional annual cost of $6 400. Employment of a contractor to remove nests and eggs, under licence, cost some $5 000 per annum, without greatly diminishing gull use of the tanks. In addition, the tanks must be repainted annually due to corrosion from the gull faeces, costing some $45 000, and the noise made by territorial gulls makes it very difficult to take readings of liquid levels using a meter that emits an audible tone. Similarly, this noise can be a problem for the occupants of buildings where gulls are nesting (Figure 2). Tug boats and marinas where *L. novaehollandiae* roosts must be hosed down daily. The annual cost for hosing tug boats was estimated by one operator to be $10 400.

There are likely to be substantial costs associated with *L. novaehollandiae* roosting and nesting on metal roofs, since there is some evidence to suggest that the corrosive action of gull faeces can halve the life of such a roof (Vermeer and Irons 1991). With the exception of a very small number of asbestos sheet roofs and one tile roof, all the roofs in Melbourne where *L. novaehollandiae* has been found nesting and roosting are metal. Replacement cost for a metal roof has been estimated at $4.00 m^2 (Leo Kuter, Hueston Roofing, pers. comm.). This means that the extra cost resulting from corrosion on roofs used for roosting or nesting by *L. novaehollandiae*, if it halves the life of the roofs, may be up to $4.00 m^{2}yr^{-1}. The areas of a sample of roofs inspected (n = 26) ranged from 192 to 46 800 m^2, giving an extra cost per year for roof replacement of (192 x 4) to (46 800 x 4) = $768 to $187 200, with a median cost of $2 328. In addition to this cost, nesting material and other debris resulting from gull activity on roofs may block gutters (Figure 3) and cause flooding that damages stock and fittings within buildings. The tenants of one of several premises in Frankston that was flooded as a result of gutters being blocked by such debris mounted a claim for $20 000 against the building's owners to cover damage to furnishings and stock.

Figure 2. Noise from roof-nesting gulls can be a problem

Figure 3. Typical Silver Gull nest site on roof, blocking gutter

Roof-nesting by *L. novaehollandiae* has been recorded in three general locations in the Greater Melbourne area. These are near Geelong 65 km southwest of the CBD; in the Coode Island/Yarraville area within 5 km of the CBD; and at Frankston, some 38 km south of the CBD. All three areas where roof-nesting occurs are within 500 metres of the sea or the Yarra River. At Frankston, a detailed study of roof-nesting by *L. novaehollandiae* was undertaken during August (the peak of the breeding season) in 2000 and 2001. Nesting was recorded on 27 roofs in August 2000 and on 58 roofs in August 2001. Forty-one of the sites were roofs newly colonized, partly in response to exclusion measures installed on some of the roofs used during 2000. There were 520 nests counted in 2001. This represented a 65% increase on 2000. This survey will be repeated in August 2002.

Four public swimming pools experienced similar problems with *L. novaehollandiae*, ranging from chicken bones regurgitated in the pools, to feathers blocking filter intakes and faeces in pools, on pool surrounds and particularly in the shallow toddlers' pools. The main additional cost incurred was extra cleaning required. This varied from under $1 000 to about $7 000. Operators commented that they often needed to double the chemical treatment of the pools, but provided no costing for this. All were concerned about the potential for bacterial contamination and possible reduction in patronage.

One bayside marina used as a gull roost at night has incurred one-off costs of $11 000 for installation of monofilament lines, extra lighting and owl effigies to deter roosting; and for purchase of a pressure cleaner. Annual cleaning costs of some $25 000 are still incurred, as gulls continue to roost at the site.

At one of Melbourne's three airports, damage to aircraft due to collision with *L. novaehollandiae* occurs on average about once per year and an indicative cost of damage was given as $500 000. At another airport, annual cost of damage attributed to *L. novaehollandiae* was reported to be highly variable, as could be expected, and to lie between some hundreds to many thousands of dollars. This airport operator also referred to annual legal costs of some $20 000 associated with negotiating licence conditions with nearby rubbish tip operators to minimise the attraction of *L. novaehollandiae* to the vicinity of the airport.

A commercial flower grower purchased a gas gun (automatic scaring device) for $1 400 to deter *L. novaehollandiae* but still has annual costs of some $5 800 for patching and replacing polythene covers for his greenhouses used as a roost site by the gulls that have fed at a nearby rubbish tip. Further unquantified costs were attributed to faeces causing a reduction in light levels over substantial areas of the covers, leading to reduced plant growth.

Rubbish tips are major attractions for *L. novaehollandiae* and operators employ a variety of means to deter the birds, mainly to comply with EPA guidelines aimed at minimising offsite problems by restricting gull numbers to fewer than 900 at any time. Common strategies include scaring programs based on use of cracker cartridges (Birdfrite) at a cost of $16 – 20 000 per year plus one-off costs of, for example, $40 000 for installation of an overhead monofilament line system that, if properly maintained, would have been an effective deterrent. Lack of maintenance meant that the effect of this system diminished rapidly over several weeks until it was of little benefit. Another rubbish tip manager employed a person for one year to crack a stockwhip as he patrolled the tipping area, at a cost of some $35 000. This measure was an effective deterrent.

A high-profile golf-course sited near several rubbish tips is a favoured *L. novaehollandiae* roost site, as, like many golf courses, it has an ornamental lake close to short grass areas, providing ideal gull bathing and loafing conditions. A scaring program comprising use of Birdfrite cracker cartridges combined with taped distress calls is operated at a cost of some $17 000 per year. A further $5 200 is incurred for removing feathers and bones left on the course, and $15 600 per annum is required for filling holes pecked by foraging gulls in the golf greens.

Discussion

Prognosis for problems caused by *L. novaehollandiae*

A wide range of problems is caused by *L. novaehollandiae* in the Greater Melbourne area. Overseas evidence suggests that some of these, such as nesting on roofs, can be expected to increase. For example, Raven and Coulson (1997) noted that, in Britain, "Since 1976, gulls nesting on buildings have continued to increase, both in terms of the number of breeding pairs (Herring Gulls *L. argentatus* by 10% per annum; Lesser Black-backed Gulls *L. fuscus* by 17% per annum) and the number of sites colonized (*L. argentatus* by 5% per annum; *L. fuscus* by 13% per annum)". Blokpoel *et al.* (1990) refer to the Ring-billed Gull *L. delawarensis* roof-nesting population increasing in the Great Lakes area of North America, and Vermeer and Irons (1991), refer to the Glaucous-winged Gull *L. glaucescens* on the Pacific coast of N. America expanding its roof-nesting population.

In Australia, *L. novaehollandiae* only nests on roofs within the Greater Melbourne area, with the exception of one wharf shed roof in Fremantle (C. Meathrel, *pers. comm.* 2001), but this behaviour can be expected to spread to other major coastal cities and perhaps even inland, as has occurred in Great Britain (Raven and Coulson 1997), if the *L. novaehollandiae* population is permitted to continue to expand. Even without overall population expansion, an increase in roof-nesting can occur, as has been shown with *L. argentatus* in Great Britain (Raven and Coulson 1997). The evidence for continuing population expansion in *L. novaehollandiae* is circumstantial, but logical. Food does not appear to be limiting. Large numbers of *L. novaehollandiae* can be seen feeding at a number of rubbish tips in the metropolitan area of Melbourne on a daily basis, and roof-nesting in the Frankston area shows an increasing trend, although data are limited to two surveys. As the *L. novaehollandiae* population increases, so does the difficulty and expense of estimating the size of the breeding population because the number of nesting and roosting sites increases and the breeding season lengthens. *L. novaehollandiae* has been recorded breeding in every month of the year in both Melbourne and Sydney (pers. obs., Smith *et al.* 1992).

A wide variety of costs is incurred by the effects of large numbers of gulls roosting and nesting on buildings and other facilities. It is difficult to aggregate costs because of the large variation in the nature of the problems caused and in the responses to those problems. In addition, some costs are recurring, while others are one-off costs. However, it is clear that costs to individuals can be substantial and the overall, and increasing, cost to the community may justify consideration of ways to reduce the overall gull population and its associated problems.

Possible ways to address problems caused by *L. novaehollandiae*

In many of the situations described above where *L. novaehollandiae* causes problems, local actions are taken that, in some cases, reduce or eliminate the problems at those sites. Almost always the problem is simply shifted to another site, rather than being eliminated. The example of roof-nesting will again serve to illustrate the point. Where barriers are installed and are effective, the gulls concerned can be assumed to move to nearby roofs, rather than ceasing to nest on roofs. Where nests and eggs are removed, re-nesting occurs within a few days on the same roofs. Experience in Great Britain suggests that the only effective means to stem the increase in roof-nesting would be to bring about a drastic reduction in adult survival and/or breeding success (Monaghan and Coulson 1977). Lethal control of *L. novaehollandiae* breeding on particular roofs may cause a temporary reduction in the number of pairs breeding on that particular roof, but is not likely to reverse the apparent trend of increasing nesting on roofs, and would do little if anything to address the other problems identified above.

A strategy more likely to be effective is to employ means to bring about the drastic reduction in adult survival and/or breeding success referred to by Monaghan and Coulson (1977). Egg-pricking, egg-oiling and habitat management are often suggested as humane ways to bring about a reduction in gull numbers (e.g. Smith and Carlile 1993b). However, where the habitat is also important for other breeding bird species, as at the major *L. novaehollandiae* breeding colony on Mud Islands in Port Phillip Bay, habitat management is unlikely to be permitted. *L. novaehollandiae* currently breeds from late July until January on Mud Islands, and estimates based on nest density at the peak of the breeding season during the mid 1980s showed that there were 50-70 000 nesting pairs of *L. novaehollandiae* (pers. obs.). The cost of attempting to control breeding by egg-pricking or egg-oiling, over such an extended breeding season, and with nests among dense shrubs, would not only be prohibitive, but would be likely to fail because inevitably many nests would be missed.

Another way to bring about a drastic reduction in breeding success may be to reverse the ecological change that has permitted the *L. novaehollandiae* population to expand: remove the human-derived food sources upon which so many gulls now seem to depend. Such a strategy would require widespread cooperation. The general public would need to be educated about the reasons for not feeding *L. novaehollandiae* and signs to this effect would need to be displayed prominently at seafront and other sites where gull-feeding is a popular activity. The major component of this strategy, however, would be to persuade rubbish tip managers to employ waste disposal practices that prevented the gulls from getting access to putrescible waste at all rubbish tips in the Greater Melbourne area. A number of methods are available to achieve this, including scaring, medium-density baling, composting, incineration and portable netting barriers surrounding the active tip face. Most of these methods are likely to cost more, at least initially, to implement than the current method of tipping rubbish into holes in the ground. This is where information about the economic cost to the community of damage caused by *L. novaehollandiae* could aid in negotiations with rubbish tip managers. The overall strategy of managing food resources for *L. novaehollandiae* would need to be part of a multi-disciplinary management effort involving State and local government, airport managers, business and relevant community groups.

At the same time that access to such abundant food sources is substantially reduced, it would be necessary to undertake a reduction in the *L. novaehollandiae* population in the Greater Melbourne area, to reduce the risk that large numbers of hungry birds could discover alternative food sources not currently exploited, such as fruit and vegetable crops, as has occurred with the Ring-billed Gull in the Great Lakes region of North America (Blokpoel and Tessier 1986). Ideally, this culling should be undertaken at the major breeding site at Mud Islands, where use of the narcotising agent alpha-chloralose on bread baits would minimise risk to non-target species while providing a humane means of culling that is readily accepted by *L. novaehollandiae* (pers. obs.). There is little doubt that objections would be raised from some sectors of the community to the idea of culling the familiar seagull and sound justification combined with the political will to authorise this action would be required. If the need for culling was put forward as an integral component of a larger strategy of reducing artificial food resources available to *L. novaehollandiae* then there may be fewer objections.

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References

Anderson, G. 1988. Silver gulls in Ballarat: an investigation of abundance, breeding and movements. 3rd year student project Ballarat College of Advanced Education Department of Applied Biology and Environmental Science, Mt Helen.

Belant, J. L. 1997. Gulls in urban environments - landscape-level management to reduce conflict. *Landscape & Urban Planning (Amsterdam)* 38:245-58.

Blokpoel, H. and Spaans, A. L. 1991. Introductory Remarks: Superabundance in Gulls: Causes, Problems and Solutions. Pages 2361-64 *in Acta XX Congressus Internationalis Ornithologici.* New Zealand Ornithological Congress Trust Board: Wellington, New Zealand.

Blokpoel, H., Weller, W. F., Tessier, G. D. and Smith, B. 1990. Roof nesting by Ring-Billed Gulls and Herring Gulls in Ontario in 1989. *Ontario Birds* 8.

Blokpoel, H., and Tessier, G.D. 1986. The Ring-billed Gull in Ontario: a review of a new problem species. Canadian Wildlife Service Occasional Papers Series Report No. 57.

Harris, M. P. 1970. Rates and causes of increases of some British gull populations. *Bird Study* 17:325-35.

Higgins, P.J., and S.J.J.F. Davies, (Eds). 1996. Handbook of Australian, New Zealand and Antarctic Birds. Volume 3: Snipe to Pigeons. Oxford University Press, Melbourne.

Horton, N., Brough, T. and Rochard, J. B. A. 1983. The importance of refuse tips to gulls wintering in an inland area of south-east England. *Journal of Applied Ecology* **20**:751-65.

Meathrel, C., Mills, J. A. and Wooller, R. D. 1991. The Silver Gull in Australia and New Zealand. Pages 2390-95 *in Acta XX Congressus Internationalis Ornithologici.* New Zealand Ornithological Congress Trust Board: Wellington, New Zealand.

Monaghan, P. and Coulson, J. C. 1977. Status of large gulls nesting on buildings. *Bird Study* **24**:89-104.

Raven, S. J. and Coulson, J. C. 1997. The distribution and abundance of *Larus* gulls nesting on buildings in Britain and Ireland. *Bird Study* **44**:13-34.

Smith, G. C. and Carlile, N. 1993a. Food and feeding ecology of breeding Silver Gulls (*Larus novaehollandiae*) in urban Australia. *Colonial Waterbirds* **16**:9-17.

Smith, G. C. and Carlile, N. 1993b. Methods for population control within a Silver Gull colony. *Wildlife Research* **20**:219-26.

Smith, G. C., Carlile, N. and Tully, S. 1992. Breeding and movements of wing-tagged Silver Gulls (*Larus novaehollandiae*) at the largest colony in New South Wales. *Wildlife Research* **19**:161-67.

Spaans, A. L. and Blokpoel, H. 1991. Concluding Remarks: Superabundance in gulls: causes, problems and solutions. Pages 2396-98 *in Acta XX Congressus Internationalis Ornithologici*. New Zealand Ornithological Congress Trust Board: Wellington, New Zealand.

Thibault, J. C., Zotier, R., Guyot, I. and Bretagnolle, V. 1996. Recent trends in breeding marine birds of the Mediterranean region with special reference to Corsica. *Colonial Waterbirds* **19**:31-40.

Vermeer, K. and Irons, D. B. 1991. The Glaucous-winged Gull on the Pacific coast of North America. Pages 2378-83 *in Acta XX Congressus Internationalis Ornithologici.* New Zealand Ornithological Congress Trust Board: Wellington, New Zealand.

Vermeer, K., Morgan, K. H., Smith, G. E. J. and York, B. A. 1991. Effects of egging on the reproductive success of Glaucous-winged Gulls. *Colonial Waterbirds* **14**:158-65.

Viksne, J., Janaus, M. and Stipniece, A. 1996. Recent trends of the Black-headed Gull *Larus ridibundus* population in Latvia. *Ornis Svecica* **6**:39-44.