

RANGE EXTENSION OF THE BLUE JAY INTO WESTERN NORTH AMERICA

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The Blue Jay (*Cyanocitta cristata*) is a common permanent resident or migratory summer resident in the eastern half of North America (reviewed by Wenger, 1975). Few extralimital winter records of Blue Jays existed in western North America prior to 1972. Since then, western sightings have been increasing annually with over 220 records in the winter of 1976-77. Because Blue Jays are usually conspicuous, easily identified, and often remain in localized urban areas for several weeks, these reports reflect a genuine increase and suggest that the Blue Jay is rapidly expanding its wintering range. Recent records also indicate a westward expansion of the breeding range. This report reviews the recent changes in the Blue Jay's distribution and offers explanations for two important questions concerning this expansion: (1) what factors are influencing this westward expansion, and (2) where is the origin of these pioneering individuals?

DISTRIBUTIONAL CHANGES

Expansion of the Breeding Range

The Blue Jay breeding range (Fig. 1) has expanded considerably since the publication of the most recent Check-list of North American Birds (American Ornithologists' Union, 1957). Blue Jays now breed as far west as the foothills of the Rocky Mountains, from Cheyenne, Wyoming, to Pueblo, Colorado, generally in the larger cities (H. Kingery, pers. comm.). They are firmly established in both the Black Hills of South Dakota (Pettingill and Whitney, 1965) and in western North Dakota (Stewart, 1976), and isolated colonies have existed in Sheridan, Wyoming (H. Kingery, pers. comm.) and Portales, New Mexico (J. Hubbard, pers. comm.) since the summer of 1975. Also Blue Jays apparently have bred in Carter and Powder River Co. in southeastern Montana (P. D. Skaar, pers. comm., 1975). Long-range vagrants may also be attracted by urban situations that provide suitable breeding habitat: a pair of Blue Jays that had wintered in Union, Oregon, raised three young in June 1977 (Van Horn and Toweill, in press).

Short-range dispersal probably has accounted for the "city-hopping" expansion of the Blue Jay's breeding range. Using Audubon Christmas Count data, Bock and Lepthien (1976) concluded that the winter distributional pattern of Blue Jays had changed between 1962 and 1971 and that their numbers had increased over 25% along the entire western edge of their range. The authors suggested that an increase in dispersal from southern and central populations accounted for this increase in numbers and for "colonization of rather marginal habitats on the western plains." However, the marginality of the habitat is debatable. For example, the Blue Jays in Portales, New Mexico, breed in the city park,

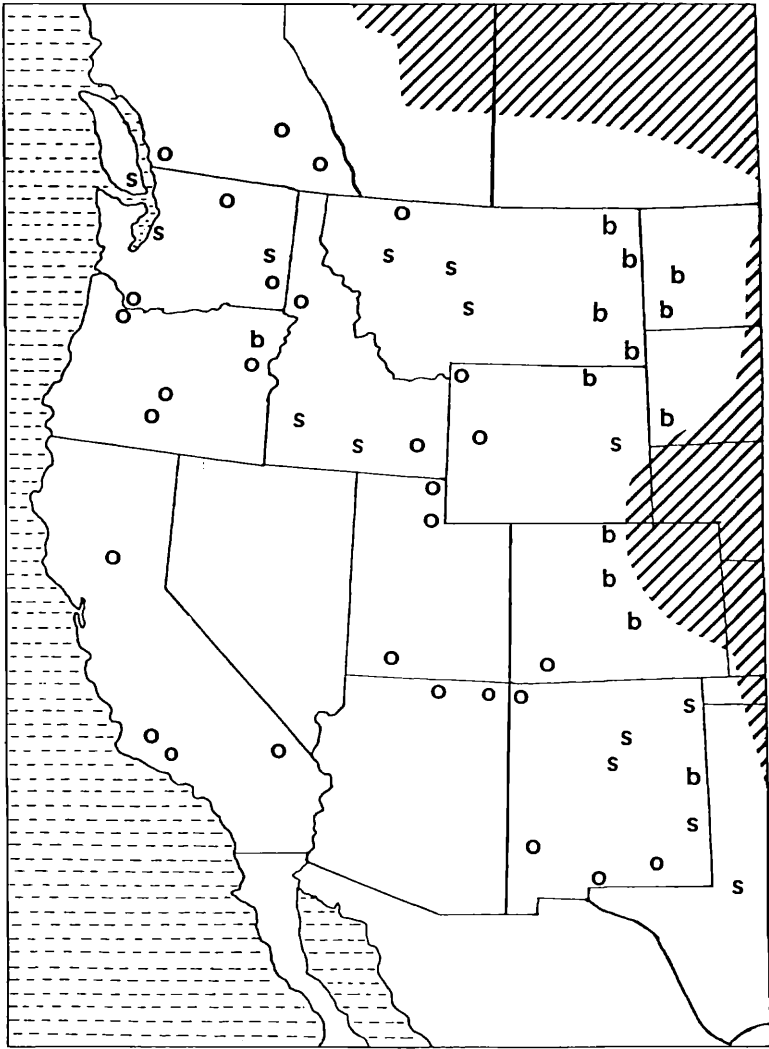


FIGURE 1. Expansion of the Blue Jay into western North America since 1957. Cross-hatched area = approximate range based on last A.O.U. Check-list (1957); b = confirmed breeding localities; o = occurrence of one or two individuals (may represent sightings over several years); s = areas where nearly annual occurrences and/or winter concentrations have been reported since 1970.

not in the semi-arid desert vegetation. Recent studies (e.g., Guthrie, 1974; Luniak, 1974; Møller, 1976; Vale and Vale, 1976; Huhtalo and Järvinen, 1977; and references therein) have shown that distinct avian communities are associated with urban areas, especially those with mature (usually exotic and ornamental) vegetation. This may be due to

specific vegetational characteristics (Hooper et al., 1975) or to urban characteristics such as the number of gardens, bird houses and feeders, cats and dogs (for discussion see Thomas et al., 1977). Also city parks may offer unique nesting opportunities depending on their size and the landscaping practices employed (Gavareski, 1976). Because Blue Jays need only a few large trees to breed successfully in an urban (Geis, 1974, 1976) or rural (Guth, 1976) environment, they therefore might be expected to occur in western cities as vegetational communities mature. Conceivably ornamental planting and landscaping have resulted in certain western cities containing deciduous and mixed-forest islands of favorable habitat much like the oak woodlands (Pettingill and Whitney, 1965) and shade-tree urbanized areas (Godfrey, 1966) preferred by Blue Jays elsewhere.

Expansion of the Wintering Range

Most western winter sightings in recent years have been from Montana, Idaho, and Washington and these states may now be regular wintering areas (Table 1). The increase in winter sightings in Wyoming

TABLE 1.

Occurrences of Blue Jays in western North America from 1970 to 1976, with pre-1970 records tallied where possible. Based upon *Audubon Field Notes* (1970), *American Birds* (1971-76), and personal communications to the author.

State	Pre-1970 Records	Winter, 1970-71	Winter, 1971-72	Winter, 1972-73	Winter, 1973-74	Winter, 1974-75	Winter, 1975-76	Winter, 1976-77
Montana	23 ¹	1	1	1	12	12	8	48
Wyoming	?	1	2	2	8	5	20	48
Idaho	2 ²	0	0	8	2	0	6	50+
Utah	3 ³	0	0	0	0	0	0	7
Arizona	0 ⁴	0	0	0	0	0	0	2
Nevada	0 ⁵	0	0	0	0	0	0	0
British Columbia	3 (?)	0	0	3	3	0	1	11
Washington	Few ⁶	2	2	1	1	8	8	46 ⁷
Oregon	0 ⁸	0	0	0	1	0	0	8
California	3 ⁹	0	0	0	1	0	0	0
Total/Winter		4	5	15	28	25	43	220+

¹ P. D. Skaar, pers. comm.

² Arvey, 1944; Burleigh, 1972.

³ Behle and Perry, 1975.

⁴ Phillips et al., 1964; K. Kaufman, pers. comm.

⁵ N. K. Johnson, pers. comm.; R. C. Banks, pers. comm.

⁶ Mattocks et al., 1976.

⁷ Weber, in press.

⁸ Gashwiler and Gashwiler, 1974.

⁹ McCaskie, 1970; M. D. Arvey, pers. comm.

reflects establishment of permanent resident populations. Unusually large numbers wintered in Utah, Oregon, and British Columbia during 1976-77, and the same winter produced two records for Arizona (K. Kaufman, pers. comm.). Most of these extralimital records are in urban or riparian situations, suggesting that such areas attract or concentrate wintering Blue Jays ("s" in Fig. 1). Nevada is the only state in the western region without a report of a Blue Jay.

The increasing numbers of wintering Blue Jays in western North America might also be due to increased populations in the Midwest. For example, the Blue Jay was accidental in Midland, Texas 20 years ago, but has become an abundant winter visitor following the maturation of live oaks planted around residences. The native pecan trees along stream courses did not attract Blue Jays (F. Williams, pers. comm.), thus adding support to the idea that maturing urban vegetation is contributing to the Blue Jay expansion. Although most of the breeding range expansion of the Blue Jay is along the entire western edge of its United States range, most of the wintering expansion is restricted to the northwestern states. This pattern suggests more than one source area for the pioneering individuals.

An analysis of North American banding data shows a strong north-south component in Blue Jay movements (Middleton, 1974), primarily among populations north of 35° latitude (Wenger, 1975) and especially west of the 100th meridian (K. G. Smith, unpubl. data). This suggests that most winter migrants are originating in Canadian populations which extend westward into central Alberta (Godfrey, 1966). Reports of Blue Jays appearing in southern Alberta (Godfrey, 1966) lend credence to this hypothesis. Furthermore, Blue Jays have been regular fall and winter visitors in southeastern Washington every year since 1968 (Weber and Larrison, 1977), but have only recently been seen with any regularity in Idaho (Table 1). Blue Jay breeding populations in western Canada are only 500 km from winter concentration areas in Washington and Idaho (Fig. 1). Banding recoveries west of the 100th meridian reveal that Blue Jays are capable of migratory movements in excess of 1,300 km (K. G. Smith, unpubl. data). A similar dispersal route has recently been shown for the Barred Owl (*Strix varia*), another expanding eastern species (Taylor and Forsman, 1976).

DISCUSSION

The increase of the Blue Jay in western North America is apparently the result of two different phenomena. Short-range dispersal is responsible for the progression of the breeding range westward, whereas long-range dispersal (and possibly migration) is responsible for the rapidly increasing number of western winter sightings. Interestingly, both movements are happening for the same reason: changes concomitant with urbanization are creating favorable habitat for Blue Jays. This does not apply solely to vegetation, but also includes proper food supplies. Although it seems unlikely that Blue Jays are food-limited (Bent, 1946),

the example from Midland, Texas mentioned above suggests that Blue Jays are at least influenced by the food base available. Bock and Lepthien (1976) suggested that bird feeders have played a major role in changing Blue Jay wintering dynamics, and many of the western winter sightings are at feeders where a bird might be seen for many weeks. Blue Jays also seem to be able to survive on fruits and berries found in exotic ornamental vegetation (Geis, 1974). Thus, urbanization not only furnishes the proper niche gestalt (*sensu* James, 1971), but also usable food resources.

Two other important questions arise concerning Blue Jay expansion: (1) what are the age classes of the migrating/dispersing individuals, and (2) will other corvids affect the Blue Jay expansion? Although answers to these questions will require further research, some speculation can be made based upon information now available.

Because young Blue Jays are known to disperse or migrate (Hardy, 1961), many western sightings may be of first-year birds. However, adult Blue Jays are also known to migrate (Laskey, 1958; Middleton, 1974). Wenger (1975) analyzed all North American Blue Jay banding recoveries before 1971 and found no correlation between age classes and migratory behavior. He estimated <10% of the total population to be truly migratory and suggested a genetic basis for the migratory behavior. Birds homozygous for the migratory trait would migrate every year and birds homozygous for the non-migratory trait would be sedentary. Heterozygous individuals would usually be sedentary, but could migrate when conditions, such as severe winter weather or population pressures, triggered such behavior. Thus, individuals of all age classes may be involved in the expansion. Because Blue Jays can be aged easily by plumage characteristics (Pitelka, 1946), age distributions could be readily investigated by western bird-banders and bird watchers.

By using urban and/or riparian situations, the Blue Jay is exploiting habitats generally unused by western corvids. Although Blue Jay \times Steller's Jay (*Cyanocitta stelleri*) hybrids have been reported (Williams and Wheat, 1971), Steller's Jays are usually rare in urban environments, more often found in montane coniferous forests. The Scrub Jay (*Aphelocoma coerulescens*) is adapted to more southerly arid woodlands and should not affect the Blue Jay expansion in the Northwest. The larger Black-billed Magpie (*Pica pica*) may represent a direct competitor although it tends to be found in more open situations. The Northwestern Crow (*Corvus caurinus*) is a common urban resident in the extreme Northwest and may be a potential competitor in that area. Blue Jays may gain some advantage over the other corvids mentioned because Blue Jays use bird feeders to a greater extent during the winter.

SUMMARY AND CONCLUSIONS

Within the last 10 years, the breeding range of the Blue Jay has expanded into eastern Montana, Wyoming, and New Mexico, and the wintering range apparently has expanded into the Northwest. Short-

range dispersal from the Midwest is suggested for the increase in the breeding range, whereas long-range dispersal (or migration) is suggested for the latter. The major reason for both of these expansions appears to be vegetational changes associated with urbanization in western cities. Because Blue Jays apparently are using habitats that other corvids neglect, encountering new breeding habitats through ornamental planting, and finding food sources in exotic vegetation and at bird feeders, there is every reason to believe their expansion will continue in western North America.

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