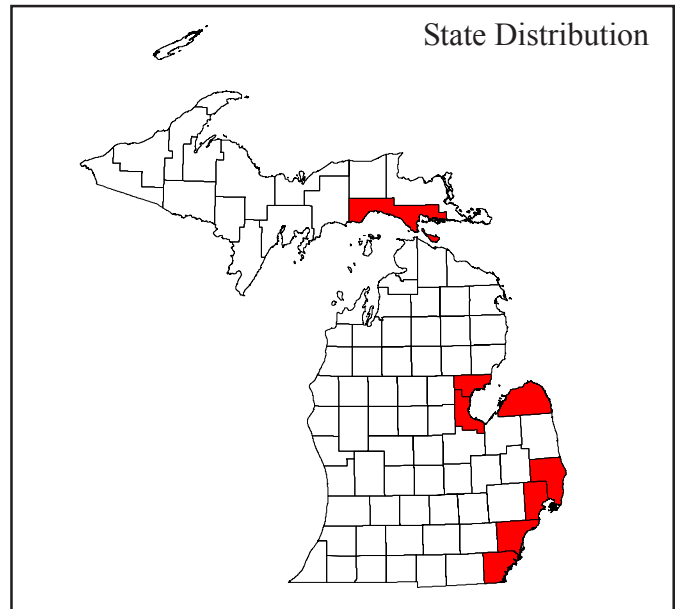
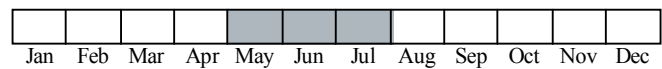




Photo by Paul Kivlin



Best Survey Period



Status: State special concern

Global and state ranks: G5/S2

Family: Laridae- Gulls and Terns

Total range: The Forster's tern is confined to the Western hemisphere and nests along the Atlantic, Gulf and Pacific coasts of the U.S. as well as the prairie and Great Lakes region of the U.S. and Canada. It winters from central California and Virginia south to Mexico and Guatemala with small numbers found in the Bahamas and Greater Antilles (AOU 1983).

State distribution: The Forster's tern is considered to be a common transient and local summer resident on the shores of the southern Lower peninsula with abundance decreasing northward. It is an uncommon migrant at inland locations (Chu 1994). The Michigan breeding population is currently limited to Saginaw Bay and Lake St. Clair, although there have been confirmed nesting records of Forster's terns on Lake Erie and on an inland lake on Bois Blanc Island (Mackinac Co.) in the past. Forster's tern nesting sites have been recorded for eight counties in Michigan including Arenac, Bay, Huron, Mackinac, Macomb, Monroe, St. Clair, and Wayne counties. Reports of possible or probable nesting have occurred in Chippewa, Emmet and Muskegon counties (Michigan Natural Features Inventory 2001, Scharf 1991).

Recognition: Forster's terns are medium-sized terns, 14 in. long (36 cm) with slender bodies, long pointed wings and deeply forked tails. Their typical call is a low nasal "ky-yarr" and a harsh, nasal, buzzy "za-a-ap". Their 31-inch (79-cm) average wingspan distinguishes them from the Caspian tern whose wingspan averages 54 inches (137 cm). In the breeding season adults are **snow white below and pale gray above with silvery white wing tips and a long deeply forked gray tail.** They have **an orange bill with a black tip, a black forehead, crown and nape, and orange legs and feet.** Although it is easily confused with the Common tern, the Forster's tern has a white breast and belly (Common has gray breast). The Forster's tern has a gray tail with white outer edges and dark inner edges (opposite pattern on white tail of Common), primaries that are lighter than the rest of wing (darker in Common) and a shorter, lower pitched call. Because Forster's terns have a pale gray back there is not much contrast between the rump and back while the Common tern's white rump contrasts with its darker gray back. Wintering adults and juvenile birds lack the black cap but are distinguished by a black eye patch and dark bill.

Best survey time: Forster's terns can be seen in Michigan from late March though December, although mid-April to mid-September is a more typical timeframe. The best time to survey for breeding birds is in May, June and July. Because Forster's terns nests are well hidden inside an interior screen of emergent vegetation, the best way to



acquire accurate locations of colonies in order to make nest counts is through the use of aerial surveys (Scharf and Shugart 1998). Once a colony is located, most often the only way to survey the nests is by using a boat to access the site and then wading out to the nests since they are frequently in shallow spots in open water away from the shoreline (Scharf 1991).

Habitat: Forster's terns nest in colonies on floating vegetation in the interior of marshes and on shallow lakes (Forbush and May 1939, Scharf 1991). In the Great Lakes, Forster's terns inhabit the embayments and connecting channels that support coastal stands of emergent vegetation. They are usually associated with the inaccessible deepwater portions of large freshwater marshes, containing cattails (*Typha* sp.) and bulrushes (*Scirpus* sp.). Colony sizes range from just a few pairs to well over 100 pairs (Best 1998, Environment Canada 2001). Nests are placed on floating rootstocks, leaves and muskrat houses as well as on mud flats and floating wracks of dead reeds pushed up by the ice in the previous winter. (Best 1998, Scharf 1991). Additionally, nests are found in the interior of flooded dredge material islands at the interface between the vegetation and standing water. Vegetation most common to these sites includes reedgrass (*Phragmites communis*) and cattail (Scharf and Shugart 1984). They also nest readily on artificial nest platforms (Environment Canada 2001). Water depths at nests range from 1.5 to 4.2 feet (0.5 to 1.3 m). Often the only way to reach nests in Michigan is by wading from a boat used to get to the site (Scharf 1991). Forster's terns and black terns often nest in the same marshes although Forster's terns nests are larger, higher and drier, and placed closer together than those of black terns (Bergman et al. 1970). The location of nests in marshes with deeper water and more open expanses give them greater protection from mammalian predators but make them more vulnerable to destruction by wind and waves (Environment Canada 2001). Nests become increasingly protected from wind and wave events with the "green up" of the emergent vegetation, which also makes the nests difficult to see. Often these breeding colonies exist as islands well removed from the shoreline and from terrestrial and semi-aquatic predators (Best 1998, Scharf 1991). The nest may be a fairly well built structure of dead grasses and bits of drift or merely a scantily lined hollow, (Baicich and Harrison 1997, Forbush and May 1939).

Biology: Forster's terns are short distance migrants and typically begin arriving in Michigan from their

wintering grounds in the first half of April with numbers peaking between late April and mid-May. Forster's terns are monogamous and raise one brood per year. Nests are built by both sexes and although data on nest initiation is lacking, it is believed that the first eggs are laid during mid to late May. Clutches are usually completed between the second or third week of May and the second or third week in June (Chu 1994, Shugart 1991). Forster's terns lay two to five eggs (usually three) and both parents incubate the nest for 23-25 days. After hatching the young remain in the nest for a few days where they are tended by both parents. They then leave the nest and run or swim actively or hide in the vegetation if disturbed. It is not known precisely when the chicks fledge but their parents feed them until they are able to fly and shortly after this adults and juveniles disperse (Baicich and Harrison 1997, Environment Canada 2001). Despite the fact that Forster's terns will readily reneest following nest failure, they have variable and often low reproductive success (Best 1998, Environment Canada 2001). The Forster's tern is very aggressive towards other bird species but sociable to its own kind (except during the breeding season) and will defend their nest vigorously (Bent 1947, Ehrlich et. al 1988).

Because of its marsh habitat, the Forster's tern eats a more varied diet than other tern species. Although little research has been done on the diet of this tern, it is reported that they eat fish as their staple food. It primarily catches small fish, which live in shallow water or in the upper levels of a larger body of water (Salt and Willard 1971). Chicks are primarily fed minnows. Forster's terns also hawk insects in the air as well as hover over the water looking for tiny morsels of food on the surface. Sometimes they make a diving plunge into the water but more often they swoop gracefully along the surface, picking up their food without wetting their plumage. They eat a limited amount of carrion, especially in the spring when they scavenge dead fish and frogs that perished during the winter. They also eat live frogs and occasionally take the eggs of American coots (*Fulica americana*) and other conspecifics (Bent 1947, Ehrlich et. al. 1988, Environment Canada 2001).

At the completion of the nesting season, fledglings and adults begin their southward migration. In the southern Lower Peninsula, concentrations of Forster's terns begin to accumulate at shoreline locations away from nesting areas between late June and mid July. Numbers



are highest in August and early September, then decline into mid-November. Fall aggregations on western Lake Erie are higher than anywhere in the state, with a single-site reporting a maximum of 1,300 birds (Chu 1994, Scharf 1991).

Conservation/Management: The Forster's tern is protected by the Migratory Bird Treaty Act. It is listed as an endangered species in Wisconsin and Illinois. Although it has the smallest population of any short-legged colonial waterbird species in Michigan, it has not been given official recognition as a threatened or endangered species since it is unclear whether the population is increasing or decreasing. In 1991, Scharf and Shugart (1998) conducted a count of colonially nesting bird species of the U.S. portions of the Great Lakes. He found 2,260 Forster's tern nests at 29 colonies. The largest regional population (1,325 nests at 19 colonies) occurred in Lake St. Clair, accounting for 59% of the total. Colonies in Green Bay comprised 35% of the nesting population. The 145 nests at eight colonies in Saginaw Bay accounted for the remaining 6.5 % of Forster's tern nests. Because the search effort for this species was low during counts conducted in 1976 and 1977 and because of the probability of overlooked colonies, comparisons between years is not appropriate (Scharf and Shugart 1998).

The nesting and feeding habits of Forster's terns make them vulnerable to changing land and water uses, especially those due to development of industrial, residential and recreational resources (Scharf and Shugart 1998). The disappearance of large amounts of coastal marsh in Saginaw Bay, particularly cattail stands, has drastically reduced the breeding habitat of this species in this area. Remaining habitat is often small and fragmented as well as closer to shore and leaves nests more vulnerable to wash out by early season storms as well as predation by avian, terrestrial and semi-aquatic predators. Periodic cycles of high water in the Great Lakes further threaten breeding success by delaying the growth of cattails needed to adequately shelter the wrack mats from wind and waves (Best 1998). Forster's tern colonies formerly nesting on dredge material have disappeared or have been unsuccessful in the recent past due to the loss of interior ponds in dredge islands, caused by evaporation, addition of more dredge material and deliberate drainage (Scharf and Shugart 1998). Although the use of artificial islands may be helpful in the short term, restoration of emergent

marsh in Saginaw Bay would benefit this species as well as other breeding birds in this area including the pied-billed grebe (*Podilymbus podiceps*), mallard (*Anas platyrhynchos*), American coot (*Fulica americana*), black tern (*Chlidonias niger*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), and marsh wren (*Cistothorus palustris*) (Best 1998).

Recreational boating wakes have had a detrimental effect on the floating aquatic vegetation that Forster's tern's use for nesting habitat. Disturbance from the noise of close personal watercraft has also caused desertion of nests and the exposure death of newly hatched chicks (Best 1998, Scharf and Shugart 1998). Best (1998) recommends the implementation of an educational outreach program directed towards recreational boaters to address this problem. The placement of signage at public access sites near breeding colonies suggesting the avoidance of cattail stands where birds exhibit aggressive and defensive behaviors could prove to be beneficial to Forster's terns. Regulation of boat numbers, boat speed and proximity of travel to the vegetation used by Forster's tern colonies may also be required (Scharf 1991).

Despite the fact that Forster's terns readily re-nest following early nest destruction or abandonment, re-nesting poses additional hazards to reproductive success. Even though Forster's tern young which hatch later are better protected from wind and waves by cattail growth, this later time period coincides with greater activity of avian predators, particularly by black-crowned night herons (*Nycticorax nycticorax*) which are actively feeding their own young during this time (Best 1998). Because colonial waterbirds are top predators in the aquatic food chain, the longer that adults reside in the Great Lakes after returning from their wintering areas, the higher the contaminant residues in the second clutch of eggs (Scharf and Shugart 1998, Yamashita et. al. 1993). Tillit et al. (1993) documented contaminant related reproductive problems in Forster's terns nesting in Green Bay. Saginaw Bay has a similar history of dioxin-like contamination as Green Bay and likely has resulted in similar reproductive impairments.

Research needs: Regular aerial searches of potential Forster's tern nesting areas in the Great Lakes are needed to acquire accurate locations of colonies, to make nest counts and to better understand the status and trends of the population. In addition, documenting



the sizes of the shifting populations of island and wetland dependent colonially nesting birds in the Great Lakes is important for establishing a baseline of ecological species diversity (Scharf and Shugart 1998). Little information is available on life expectancy, mortality rates, sex ratio and average lifespan in Forster's terns so it is difficult to calculate the level of reproductive success needed to sustain their population. Contaminant analysis in conjunction with an accurate census and reproductive data is needed to assess the impacts of toxic chemicals on reproduction in Forster's terns (Scharf 1991).

Related abstracts: Great Lakes marsh, black tern, Caspian tern, and common tern.

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Abstract Citation:

Hyde, D. 2001. Special animal abstract for *Sterna forsteri* (Forster's tern). Michigan Natural Features Inventory. Lansing, MI. 4 pp.

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Funding for abstract provided by Michigan Department of Natural Resources-Forest Management Division and Wildlife Division.

