



## **Patterns of Duck Hunting Activity and Success in New Jersey, 1999-2011**

### **EXECUTIVE SUMMARY**

We examined Harvest Information Program data to discern contemporary patterns of duck hunter activity and success in New Jersey at the zone level. Hunters were most active in the North and South Zones during the first split (October) with smaller, second peaks in hunting activity during the opening of the second split, Thanksgiving, and Christmas. Coastal Zone hunting activity was relatively stable throughout the season except for a strong peak during the Christmas-New Year period. Hunter success indices, expressed as ducks harvested per hunter-day, were relatively constant across the season in all zones. Atlantic brant hunter success indices were slightly higher during November than later in the winter.

### **INTRODUCTION**

Selecting hunting season dates for migratory game birds is a balance between science and social factors. Managers consider the average timing of waterfowl migrations and weather patterns each fall as well as social factors including traditional hunter preferences and holiday periods. Because of the diversity of habitats waterfowlers hunt, time spent pursuing additional quarry (e.g.: deer, striped bass fishing), competition with work schedules and other conflicts, and traditions of when hunters prefer to hunt, it is not surprising that many hunters have different opinions on waterfowl season selections.

This diversity of opinions can make selecting annual waterfowl season dates challenging. To better serve the state's duck hunters, the New Jersey Division of Fish and Wildlife (Division) conducted a waterfowl hunter survey during the winter of 2012-13 (see [2012-2013 NJ Waterfowl Hunter Survey](#), pdf,300kb).

To augment the results of the hunter survey and to inform future season date selections, we examined contemporary patterns of duck hunting activity. In addition, we investigated whether duck hunter success, as defined by the number of ducks harvested per hunter-day, varied during the course of the season in each zone. It would seem reasonable that hunter success might be higher during particular time periods if ducks were more abundant during that time period. If hunter success were higher during a particular time period, logic would follow that hunters would want to target that particular time period within that zone when selecting hunting season dates.

## METHODS

The US Fish and Wildlife Service, Division of Migratory Birds, Branch of Harvest Surveys (USFWS), conducts annual surveys of waterfowl hunters to estimate waterfowl harvest and hunting activity. Hunters are selected through each state's Harvest Information Program (HIP), a certification that is required of all migratory bird hunters. Selected hunters receive a journal to record the date and county where they hunted, along with the number of ducks and geese they harvested.

We obtained raw (e.g. not extrapolated) duck and Atlantic brant harvest and hunter-day data from the USFWS for New Jersey summarized by 5-day period (e.g. Oct 20-25) and county from 1999-2011. We selected data since 1999 because that coincided with when the HIP survey was fully implemented and standardized. In addition, all of the years selected had 60-day duck seasons reducing bias that might be associated with varying duck season lengths.

New Jersey has 3 waterfowl hunting zones, North, South, and Coastal (Figure 1) which are separated by major roadways. We partitioned the 5-day county data into each of the 3 waterfowl zones to derive estimates of hunter activity and harvest for each of the 3 zones. Since some counties fall into 2 or more zones, we made some assumptions on which zone particular hunting activity or harvest occurred. First, whenever possible, we used dates to assign county data to a particular zone. For example, Atlantic County is within both the Coastal and South Zones; from 1999-2011, the Coastal Zone never opened prior to October 30 and the South Zone never was open later than January 10. As such, we assigned all Atlantic County data prior to November 1 to the South Zone and all data after January 10 to the Coastal Zone. For dates when two or more zones were open simultaneously within the same county, we used expert opinion from 3 state waterfowl biologists (1 current; 2 retired) with a combined 90 years experience managing waterfowl in New Jersey. Each biologist independently estimated the proportion of the county harvest that occurred within each zone when seasons were open simultaneously and we used the average from these estimates. For example, for Atlantic County, we assumed that during dates of overlap, that 85% of the duck harvest and activity occurred in the Coastal Zone and 15% occurred in the South Zone. Data with unknown date or county were excluded from analyses. Since there is considerable annual variation of harvest and hunting

Figure 1. New Jersey Waterfowl Hunting Zones



activity, data were averaged for each 5-day period across all 13 years. Only 5-day periods with at least 2 years of data were included in the analysis.

We plotted hunter activity data by 5-day period for each zone. To obtain an index of hunter success for each zone, we divided the harvest estimate by the hunter-days estimate for the corresponding 5-day period. We plotted these indices by 5-day period for each zone to examine seasonal trends in hunter success.

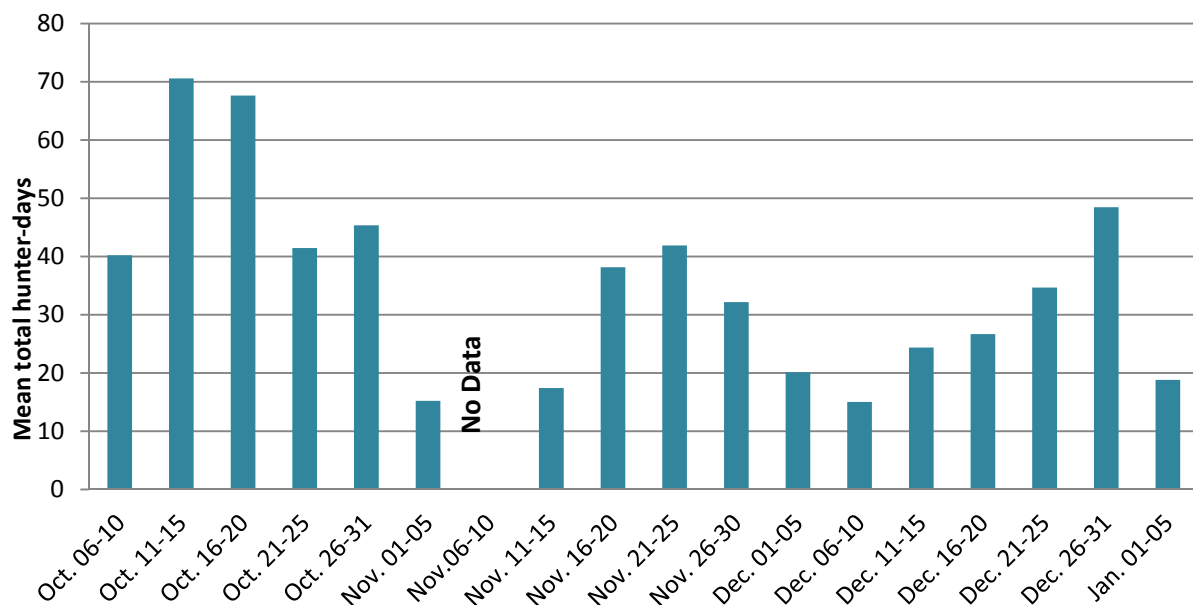
We assumed that all Atlantic brant (brant) harvest occurred in the Coastal Zone. Although brant seasons are always open within the duck seasons, the brant season is shorter than the duck season during most years. As such, it becomes problematic to use duck hunter-days from the HIP data when calculating an index of hunter success for brant. As such, we summed the total season days for each 5-day period for the same span of 13 years (1999-2011) and used that number as the divisor when calculating a brant hunter success index.

## RESULTS

### Patterns of Hunting Activity

The North (Figure 1) and South (Figure 2) Zones showed similar patterns of duck hunting activity. Both zones had the strongest peaks of hunting activity during the first split in mid-October. In addition, both zones had smaller peaks in hunting activity which coincided with the opening of the second split (mid-November), Thanksgiving, and the Christmas-New Year's holiday period. Both zones had the lowest hunting activity during December 6-10 which typically coincides with at least part of the 6-day Firearm Deer Season.

**Figure 1. Mean total hunter-days by 5-day period 1999-2011, NORTH ZONE.**



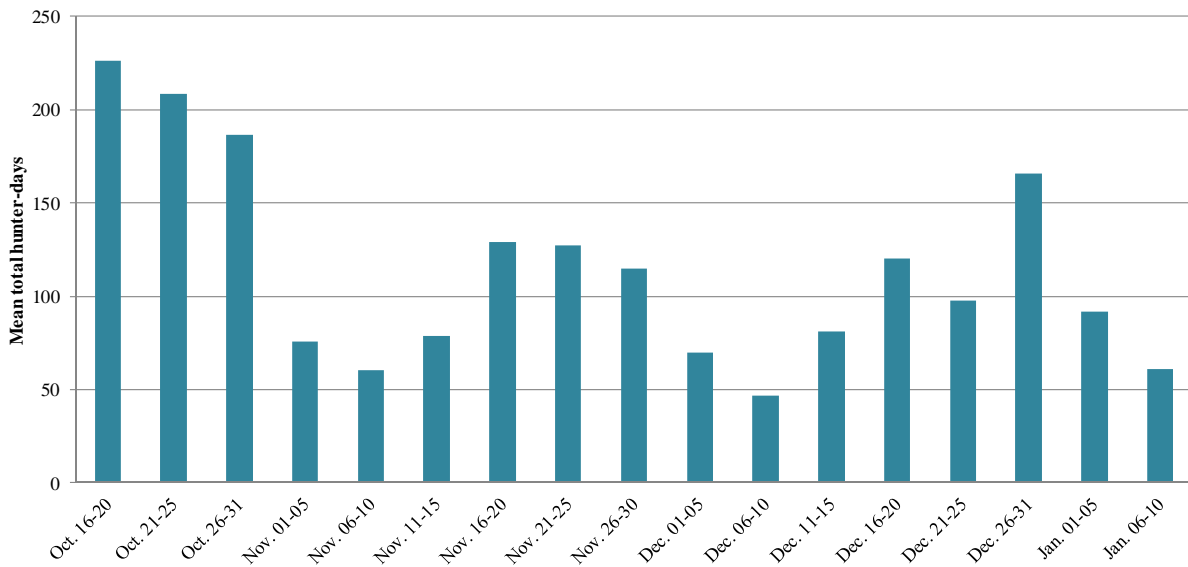


Figure 2. Mean total hunter-days by 5-day period 1999-2011, SOUTH ZONE.

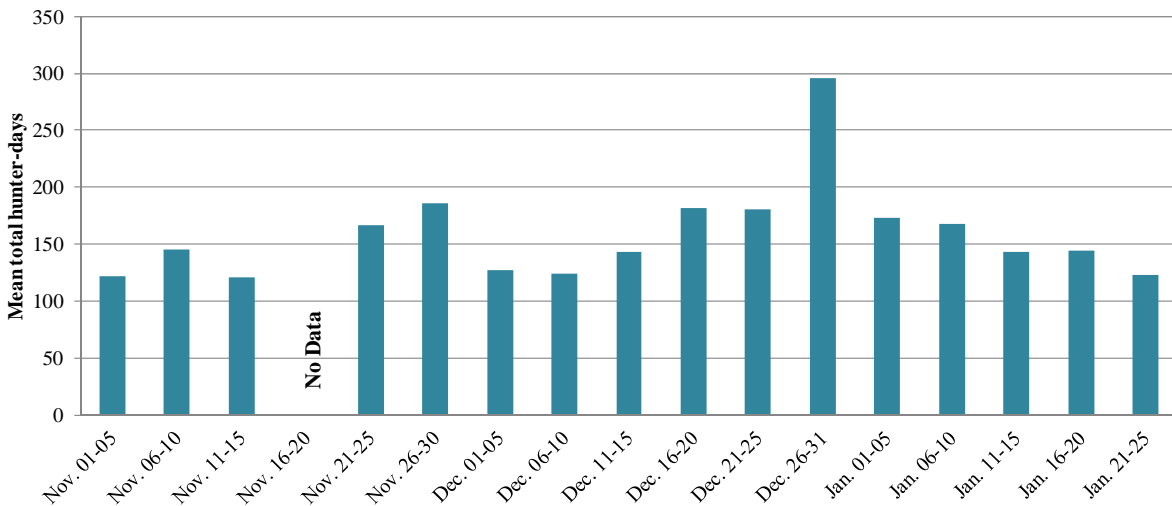


Figure 3. Mean total hunter days by 5-day period 1999-2011, COASTAL ZONE.

In the Coastal Zone hunter activity was relatively constant through the duration of the season with the exception of a strong peak during the Christmas-New Year period (Figure 3).

## Indices of Hunter Success

Perhaps surprisingly, all 3 waterfowl zones showed no apparent trend in hunter success (Figures 4-6) through the duration of the season. For brant, the index of hunter success was generally higher in November with a strong peak that coincided with the Thanksgiving holiday (Figure 7).

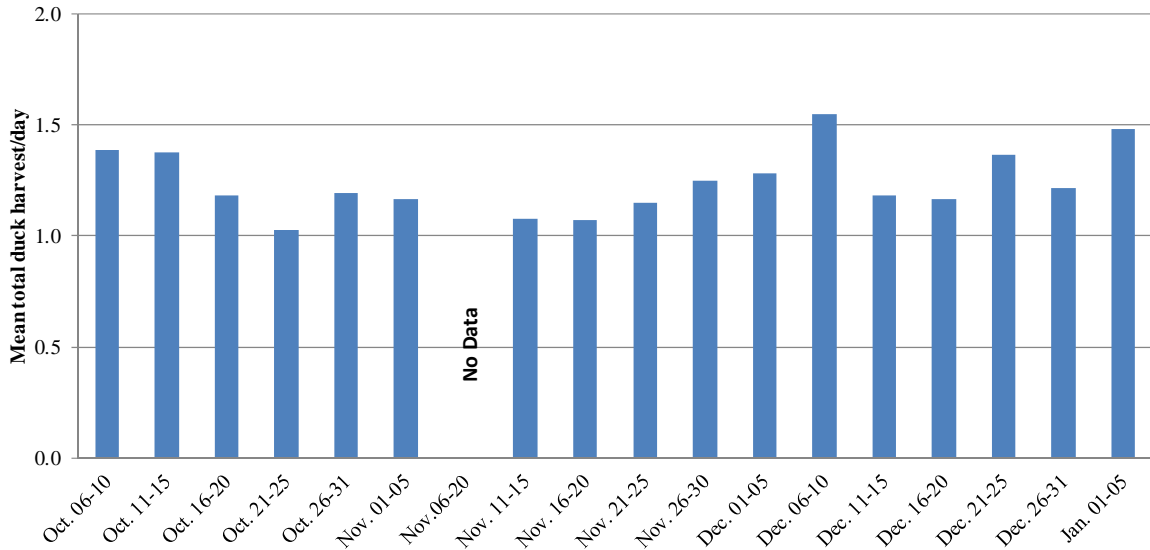


Figure 4. Mean total duck harvest per hunter-day by 5-day period 1999-2011, NORTH ZONE.

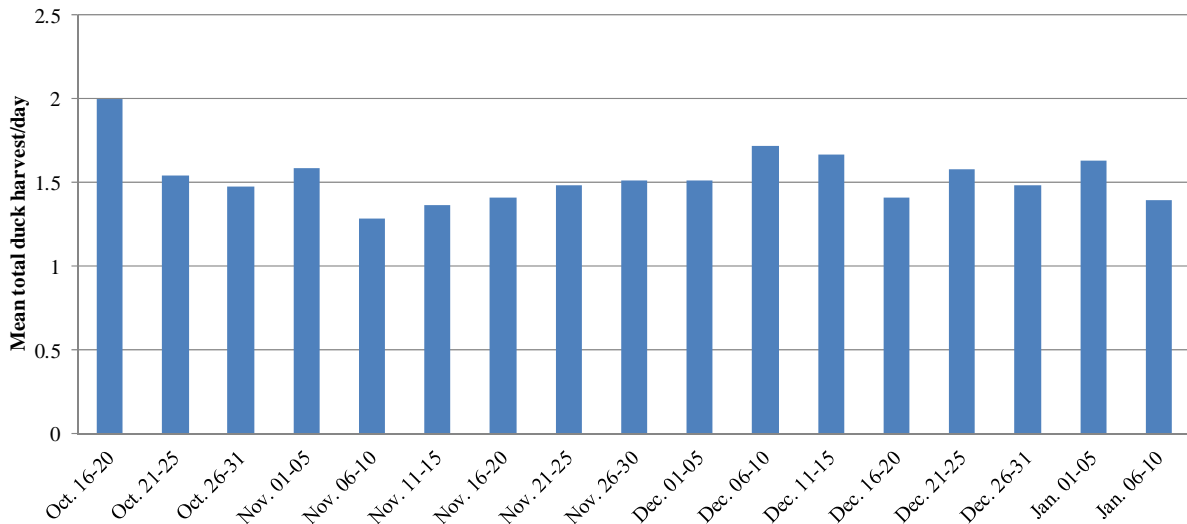


Figure 5. Mean total duck harvest per hunter-day by 5-day period 1999-2011, SOUTH ZONE.

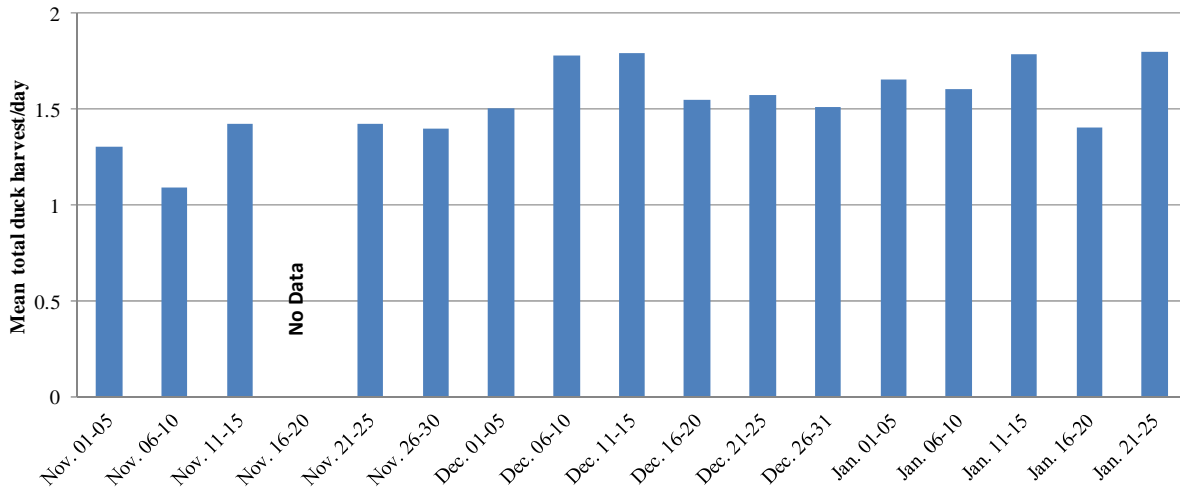


Figure 6. Mean total duck harvest per hunter-day by 5-day period 1999-2011, COASTAL ZONE.

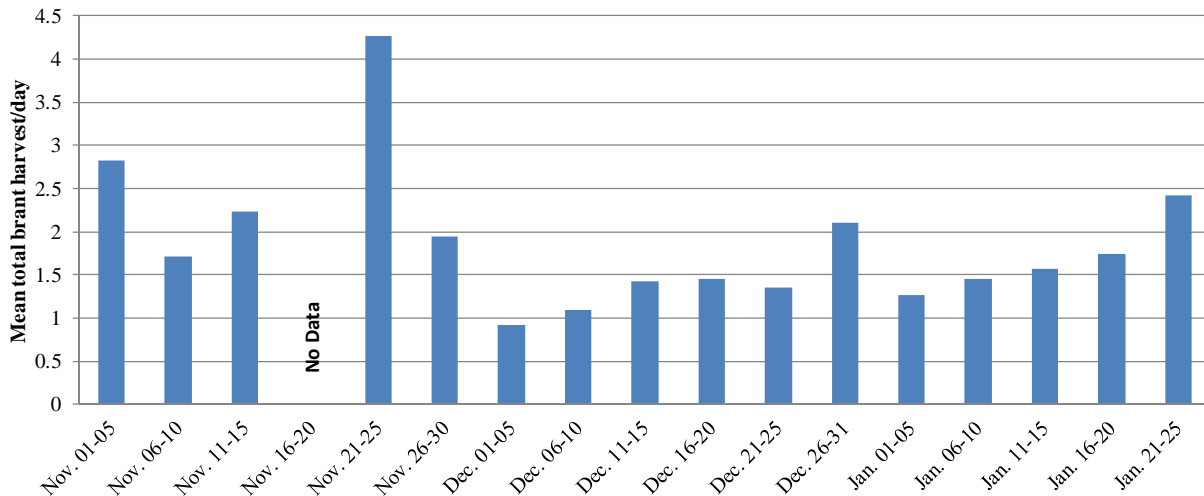


Figure 7. Mean total brant harvest per season-day by 5-day period 1999-2011, COASTAL ZONE.

## DISCUSSION

The North and South Zones both had the strongest peaks of hunting activity during the first split in mid-October. Interestingly, the [2012-13 New Jersey Waterfowl Hunter Survey](#) (pdf, 300kb) indicated that the majority of South Zone hunters wanted to increase the length of the second split into January by taking days from the first split, despite the fact that HIP data in this report suggests October is an important time for these hunters. Several important South Zone species, particularly green-winged teal and wood ducks, consistently migrate early in the fall and in an

average year, are typically much less abundant by early December. Green-winged teal and wood ducks rank number 3 and 5, respectively, in the New Jersey duck harvest. Reducing the length of the first split in the South Zone could reduce the harvest of these species.

Contemporary HIP data do not suggest a single best period or periods when duck hunting success is highest in any zone. The lack of patterns suggest that hunter success is not predictable and likely depends upon variables which the Division cannot control such as weather and resultant waterfowl migration patterns and hunter's personal schedules. Without a predictable pattern in hunter success, managers would likely be more inclined to give hunters the season dates of their preference as derived from a survey. The brant index of hunter success was somewhat higher during November, particularly during the Thanksgiving holiday period suggesting that November may be the best period to hold brant seasons when they are shorter than the 60-day duck season.

### **Acknowledgment**

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