As part of its responsibility in implementing the goals stated by NAWMP, joint ventures are developing habitat goals that are biologically linked to the breeding population goals. Ultimately, these goals are to be expressed as an amount of habitat that needs to be protected, enhanced or restored in the ACJV area in order to contribute to achieving NAWMP waterfowl population objectives at the regional and continental scales. At this time there is no consensus on how migratory or wintering waterfowl populations and habitat relate to the breeding objectives of NAWMP. The NAWMP National Science Support Team (NSST) has therefore recommended an interim method that uses a combination of MWS and harvest data to proportionally allocate the continental objectives between the various joint ventures. An evaluation of these methods indicates that this allocation works reasonably well for most duck species (exceptions include: Mottled Duck, whistling-ducks, Blue-winged Teal and Wood Ducks) but not for geese in general (M. Koneff, pers. comm.).

Implicit in such an endeavor is the assumption that local or regional actions are hierarchical in nature and can be aggregated to, in this case, a larger spatial scale. Although intuitive, there is no clear consensus on the functional form of such a relationship. In the absence of a clear analytical solution to the problem, the NSST reviewed alternative approaches and reached consensus in November 2003. As the official technical advisory committee of NAWMP, the NSST recommendations are being followed by non-breeding joint ventures in North America. The method being recommended by the NSST is a three-step approach that allows non-breeding joint ventures to “step-down” the continental population goals into regional goals that can be used for planning habitat delivery programs. The NSST recommends that these numbers not be used as a performance metric per se, but only for baseline planning purposes. As such the first step of the process is to determine the proportion of the continental population goals a joint venture might be responsible for over-wintering. The second step is to explicitly state the assumptions being made as to the regional requirements of waterfowl, resource availability and assess trends of the resource. Lastly, joint ventures need to evaluate the validity of the assumptions made in the second step.

The NSST recommendations only concern the first of this process: determination of the proportional allocation of continental objectives to the regional scale. The NSST is advocating the use of MWS and county level, species specific harvest data as a reasonable first approximation of the wintering distribution of waterfowl. It was noted that use of this approach incorporates all the potential biases that have been identified regarding the MWS data (Heusmann, Eggemann and other citations here). Although there are local data sets that might overcome some of these limitations, there is no other data set that covers the entire joint venture that could be used as a surrogate. Likewise, the county-level harvest data contain their own biases but lack of an alternate surrogate argues in favor of their use.

The ACJV Gamebird Technical endorsed moving forward with setting state-level population goals for the ACJV using the county-level harvest data. Steps to calculate ACJV waterfowl population goals from Parts Collection Survey data

1. Acquired county level harvest data from Harvest Survey Branch in Laurel, MD. These data contain adjusted weights representing total harvest for each day in a given year.
2. Adjusted weights are added together within the specified time period (fall, winter or full season) to give estimate of total harvest for each species for each of the ten years in the data set. Result is a county level estimate of harvest for each of ten years (maximum n). See example at end.
3. Total US harvest is estimated by summing across all counties each species was harvested in for each year in the data set (again 10 estimates possible). This becomes the denominator for step #4.
4. The sums from step #2 (county level estimates) are divided by the total US harvest to give an estimate of the proportional harvest occurring in any county in a given year.
5. These county level estimates of proportional harvest are multiplied by either the NAWMP 2004 continental population goal or continental population estimate to arrive at the population goal for any given county in any of the ten years. Since the estimates vary across the 10 years, we can use this information to calculate confidence limits for our estimated population goals. Some species, e.g., Ring-necked Duck do not have a population goal. In these instances, the current continental population estimate is used to derive state population goals.
6. County level population goals are summed within any given year to arrive at state goal.

Time period definitions:

Fall – September through November (months 9 – 11 in dataset)

Winter – December through end of season (months greater than or equal to 12)

Full Season – all data

The Gamebird Technical committee recommends use of the “Full Season” objectives, but notes there are cases where it is important to understand how population goals might be distributed seasonally.

|  |  |  |  |
| --- | --- | --- | --- |
| **Species** | **Mean Population Goal** | | |
|  | **Fall** | **Winter** | **Full** |
| **American Black Duck** |  |  |  |
| Connecticut | 16,284 | 29,241 | 23,955 |
| Delaware | 26,268 | 44,016 | 36,749 |
| Florida | 2,393 | 1,140 | 727 |
| Georgia | 3,597 | 4,725 | 3,462 |
| Maine | 77,940 | 22,988 | 44,660 |
| Maryland | 55,853 | 118,739 | 93,903 |
| Massachusetts | 27,042 | 24,508 | 25,429 |
| New Hampshire | 16,338 | 8,898 | 11,807 |
| New Jersey | 83,436 | 75,466 | 78,083 |
| New York | 173,293 | 116,952 | 138,569 |
| North Carolina | 3,097 | 47,617 | 28,946 |
| Pennsylvania | 64,777 |  | 61,242 |
| Rhode Island | 5,653 | 11,816 | 9,341 |
| South Carolina | 4,198 | 12,019 | 8,365 |
| Vermont | 28,792 | 2,762 | 13,099 |
| Virginia | 29,522 | 89,365 | 65,148 |
| West Virginia | 924 | 3,610 | 2,383 |
|  |  |  |  |
| **American Green-winged Teal** |  |  |  |
| Connecticut | 5,546 | 1,051 | 3,458 |
| Delaware | 44,461 | 11,403 | 30,362 |
| Florida | 24,386 | 62,509 | 39,658 |
| Georgia | 8,932 | 21,589 | 13,959 |
| Maine | 23,908 | 435 | 13,788 |
| Maryland | 67,251 | 21,438 | 47,164 |
| Massachusetts | 5,505 | 602 | 3,371 |
| New Hampshire | 4,175 | 329 | 2,455 |
| New Jersey | 35,312 | 9,867 | 24,417 |
| New York | 54,523 | 3,003 | 32,440 |
| North Carolina | 39,958 | 79,565 | 56,144 |
| Pennsylvania | 30,074 | 2,763 | 18,307 |
| Rhode Island | 857 | 188 | 528 |
| South Carolina | 17,492 | 73,758 | 41,069 |
| Vermont | 10,711 | 189 | 6,064 |
| Virginia | 14,519 | 31,293 | 21,523 |
| West Virginia | 281 | 427 | 316 |
|  |  |  |  |
| **American Wigeon** |  |  |  |
| Connecticut | 1,199 | 2,420 | 1,297 |
| Delaware | 4,476 | 3,939 | 4,112 |
| Florida | 5,576 | 18,298 | 10,908 |
| Georgia | 1,921 | 7,463 | 3,837 |
| Maine | 1,124 | 634 | 634 |
| Maryland | 17,302 | 18,525 | 17,362 |
| Massachusetts | 947 | 457 | 530 |
| New Hampshire | 306 | 1,654 | 267 |
| New Jersey | 2,760 | 3,662 | 2,997 |
| New York | 19,573 | 3,756 | 12,167 |
| North Carolina | 15,229 | 65,430 | 35,898 |
| Pennsylvania | 6,084 | 1,377 | 3,796 |
| Rhode Island | 588 | 2,332 | 1,175 |
| South Carolina | 3,466 | 24,866 | 12,334 |
| Vermont | 1,082 | 477 | 620 |
| Virginia | 4,863 | 21,038 | 10,981 |
| West Virginia | 194 | 644 | 194 |
|  |  |  |  |
| **Atlantic Brant** |  |  |  |
| Connecticut | 6,316 | 3,574 | 3,663 |
| Delaware | 12,117 | 9,829 | 8,689 |
| Maryland | 4,044 | 8,769 | 7,472 |
| Massachusetts | 6,962 | 4,715 | 4,395 |
| New Jersey | 84,558 | 39,526 | 48,164 |
| New York | 46,697 | 36,446 | 39,379 |
| North Carolina |  | 36,970 | 29,565 |
| Pennsylvania | 8,363 | 0 | 2,022 |
| Rhode Island | 2,774 | 5,226 | 4,449 |
| Vermont | 1,882 |  | 623 |
| Virginia | 21,243 | 32,159 | 27,154 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| **Blue-winged/Cinnamon Teal** |  |  |  |
| Connecticut | 531 |  | 463 |
| Delaware | 5,732 | 4,106 | 5,075 |
| Florida | 188,144 | 1,588,375 | 404,591 |
| Georgia | 32,284 | 33,061 | 31,476 |
| Maine | 4,708 |  | 3,937 |
| Maryland | 21,636 | 10,631 | 19,197 |
| Massachusetts | 603 |  | 498 |
| New Hampshire | 664 |  | 571 |
| New Jersey | 1,389 | 3,528 | 1,167 |
| New York | 12,348 | 5,856 | 10,436 |
| North Carolina | 24,241 | 19,454 | 23,695 |
| Pennsylvania | 8,665 |  | 7,344 |
| Rhode Island | 320 |  | 280 |
| South Carolina | 36,205 | 269,495 | 68,669 |
| Vermont | 1,878 |  | 1,557 |
| Virginia | 5,987 | 12,124 | 5,502 |
| West Virginia | 1,084 |  | 924 |
|  |  |  |  |
| **Canvasback** |  |  |  |
| Connecticut |  | 2,787 | 1,336 |
| Delaware |  | 1,089 | 392 |
| Florida | 1,184 | 8,816 | 3,959 |
| Georgia | 1,855 | 7,773 | 3,422 |
| Maine |  | 5,526 | 1,199 |
| Maryland |  | 71,647 | 36,790 |
| Massachusetts | 519 | 901 | 518 |
| New Jersey |  | 3,450 | 1,694 |
| New York | 3,236 | 9,386 | 5,549 |
| North Carolina | 2,824 | 9,359 | 4,741 |
| Pennsylvania | 2,782 | 1,549 | 1,262 |
| Rhode Island |  | 1,283 | 662 |
| South Carolina | 2,255 | 4,096 | 2,392 |
| Vermont | 549 |  | 302 |
| Virginia | 1,461 | 19,688 | 9,699 |
| West Virginia |  | 989 | 474 |
|  |  |  |  |
|  |  |  |  |
| **Gadwall** |  |  |  |
| Connecticut | 520 | 1,411 | 769 |
| Delaware | 5,702 | 6,523 | 6,023 |
| Florida | 4,342 | 4,066 | 3,496 |
| Georgia | 4,609 | 16,628 | 9,775 |
| Maine | 477 |  | 240 |
| Maryland | 8,109 | 14,006 | 11,002 |
| Massachusetts | 901 | 457 | 443 |
| New Hampshire | 223 |  | 109 |
| New Jersey | 1,236 | 2,324 | 1,745 |
| New York | 7,659 | 3,233 | 5,273 |
| North Carolina | 10,836 | 38,464 | 24,284 |
| Pennsylvania | 6,751 | 2,944 | 4,732 |
| Rhode Island | 243 | 1,041 | 595 |
| South Carolina | 6,673 | 18,795 | 12,363 |
| Vermont | 426 | 204 | 210 |
| Virginia | 5,538 | 33,703 | 19,922 |
| West Virginia | 235 | 256 | 151 |
|  |  |  |  |
| **Mallard** |  |  |  |
| Connecticut | 24,866 | 39,086 | 30,919 |
| Delaware | 24,951 | 61,793 | 41,291 |
| Florida | 1,495 | 3,146 | 1,799 |
| Georgia | 9,986 | 47,162 | 27,959 |
| Maine | 45,683 | 10,583 | 28,896 |
| Maryland | 98,430 | 204,330 | 146,500 |
| Massachusetts | 24,637 | 18,672 | 21,159 |
| New Hampshire | 21,230 | 7,704 | 14,589 |
| New Jersey | 44,086 | 45,659 | 44,060 |
| New York | 289,546 | 149,837 | 218,663 |
| North Carolina | 49,751 | 150,670 | 95,654 |
| Pennsylvania | 226,546 | 188,306 | 204,640 |
| Rhode Island | 2,495 | 7,322 | 4,637 |
| South Carolina | 24,036 | 113,115 | 64,757 |
| Vermont | 40,139 | 5,512 | 23,659 |
| Virginia | 49,868 | 193,374 | 114,502 |
| West Virginia | 3,165 | 9,893 | 6,163 |
|  |  |  |  |
| **Northern Pintail** |  |  |  |
| Connecticut | 1,209 | 1,235 | 773 |
| Delaware | 15,844 | 12,518 | 13,445 |
| Florida | 11,515 | 26,272 | 15,828 |
| Georgia | 2,933 | 5,571 | 2,535 |
| Maine | 3,828 | 1,169 | 2,271 |
| Maryland | 12,184 | 23,431 | 16,760 |
| Massachusetts | 654 | 1,440 | 739 |
| New Hampshire | 938 |  | 533 |
| New Jersey | 6,236 | 7,056 | 6,296 |
| New York | 31,907 | 4,743 | 19,834 |
| North Carolina | 15,625 | 61,756 | 31,657 |
| Pennsylvania | 5,327 | 5,909 | 4,067 |
| Rhode Island | 389 | 649 | 301 |
| South Carolina | 3,721 | 14,377 | 6,427 |
| Vermont | 3,855 | 659 | 2,082 |
| Virginia | 3,362 | 18,413 | 8,646 |
| West Virginia | 117 | 502 | 169 |
|  |  |  |  |
| **Northern Shoveler** |  |  |  |
| Delaware | 11,555 | 10,816 | 11,143 |
| Florida | 21,067 | 49,190 | 33,845 |
| Georgia | 4,372 | 10,856 | 6,078 |
| Maine | 648 | 1,116 | 547 |
| Maryland | 5,438 | 7,603 | 5,715 |
| Massachusetts |  | 764 | 368 |
| New Jersey | 1,920 | 4,691 | 2,961 |
| New York | 5,628 | 3,367 | 3,977 |
| North Carolina | 11,740 | 24,834 | 17,791 |
| Pennsylvania | 3,629 | 2,821 | 2,366 |
| Rhode Island |  | 395 | 196 |
| South Carolina | 5,700 | 25,261 | 14,761 |
| Vermont | 885 |  | 470 |
| Virginia | 4,685 | 6,998 | 5,005 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| **Redhead** |  |  |  |
| Connecticut |  | 6,258 | 1,400 |
| Delaware | 1,006 | 2,223 | 713 |
| Florida | 6,298 | 15,841 | 7,768 |
| Georgia | 2,703 | 17,277 | 4,362 |
| Maryland | 3,908 | 14,568 | 4,741 |
| Massachusetts |  | 737 | 220 |
| New Jersey | 465 | 8,803 | 2,442 |
| New York | 2,590 | 39,156 | 13,111 |
| North Carolina | 1,514 | 41,149 | 12,334 |
| Pennsylvania | 3,448 | 7,743 | 2,804 |
| Rhode Island |  | 869 | 233 |
| South Carolina | 1,800 | 14,194 | 4,448 |
| Vermont | 295 |  | 216 |
| Virginia | 1,505 | 20,141 | 5,812 |
| West Virginia |  | 784 | 192 |
|  |  |  |  |
| **Ring-necked Duck** |  |  |  |
| Connecticut | 1,167 | 1,435 | 1,000 |
| Delaware | 2,709 | 2,748 | 2,196 |
| Florida | 102,045 | 286,891 | 185,692 |
| Georgia | 23,756 | 70,760 | 45,545 |
| Maine | 5,581 | 531 | 3,071 |
| Maryland | 5,750 | 15,342 | 9,539 |
| Massachusetts | 1,001 | 955 | 791 |
| New Hampshire | 1,585 | 334 | 848 |
| New Jersey | 1,713 | 2,551 | 1,998 |
| New York | 23,148 | 2,730 | 13,663 |
| North Carolina | 24,591 | 100,013 | 58,581 |
| Pennsylvania | 9,926 | 4,778 | 7,046 |
| Rhode Island | 295 | 230 | 171 |
| South Carolina | 28,518 | 100,986 | 60,893 |
| Vermont | 3,569 | 325 | 1,990 |
| Virginia | 13,832 | 75,718 | 42,225 |
| West Virginia | 428 | 474 | 278 |
|  |  |  |  |
|  |  |  |  |
| **Ruddy Duck** |  |  |  |
| Connecticut | 7,787 | 8,314 | 5,501 |
| Delaware | 11,458 | 14,709 | 8,559 |
| Florida | 28,832 | 142,839 | 65,550 |
| Georgia | 35,355 | 74,628 | 29,931 |
| Maine | 5,903 |  | 3,683 |
| Maryland | 31,490 | 85,949 | 50,685 |
| Massachusetts | 3,775 | 2,164 | 1,781 |
| New Hampshire | 3,309 |  | 1,437 |
| New Jersey | 26,991 | 22,672 | 23,015 |
| New York | 11,214 | 14,922 | 7,966 |
| North Carolina | 54,912 | 204,045 | 120,544 |
| Pennsylvania | 57,727 | 22,638 | 36,498 |
| Rhode Island |  | 4,714 | 1,818 |
| South Carolina | 15,004 | 13,958 | 7,064 |
| Vermont | 10,771 |  | 5,256 |
| Virginia | 18,294 | 55,927 | 25,535 |
| West Virginia | 3,478 | 2,981 | 1,530 |
|  |  |  |  |
| **Scaup (Lesser & Greater Combined)** | |  |  |
| Connecticut | 976 | 11,652 | 5,457 |
| Delaware | 7,303 | 10,377 | 6,899 |
| Florida | 70,613 | 266,380 | 162,480 |
| Georgia | 21,254 | 59,847 | 36,480 |
| Maine | 8,815 | 5,454 | 5,061 |
| Maryland | 20,421 | 545,682 | 259,281 |
| Massachusetts | 1,706 | 4,798 | 2,152 |
| New Hampshire | 2,814 | 2,975 | 1,952 |
| New Jersey | 10,181 | 65,690 | 34,246 |
| New York | 79,350 | 162,491 | 114,938 |
| North Carolina | 88,452 | 787,986 | 408,348 |
| Pennsylvania | 74,957 | 47,187 | 59,458 |
| Rhode Island | 1,548 | 11,393 | 5,498 |
| South Carolina | 22,743 | 111,377 | 62,599 |
| Vermont | 10,503 | 1,985 | 6,079 |
| Virginia | 24,182 | 158,704 | 83,055 |
| West Virginia |  | 1,054 | 519 |
|  |  |  |  |
| **Wood Duck** |  |  |  |
| Connecticut | 19,024 | 2,438 | 12,125 |
| Delaware | 23,977 | 7,489 | 17,213 |
| Florida | 34,462 | 69,189 | 48,196 |
| Georgia | 102,036 | 480,893 | 255,652 |
| Maine | 38,703 | 1,243 | 23,055 |
| Maryland | 72,472 | 13,837 | 48,739 |
| Massachusetts | 18,667 | 621 | 11,204 |
| New Hampshire | 25,519 | 512 | 15,198 |
| New Jersey | 30,732 | 1,532 | 18,773 |
| New York | 145,961 | 4,538 | 88,397 |
| North Carolina | 201,783 | 358,773 | 265,523 |
| Pennsylvania | 247,925 | 7,512 | 151,540 |
| Rhode Island | 2,178 | 448 | 1,369 |
| South Carolina | 113,230 | 563,723 | 293,592 |
| Vermont | 21,672 | 530 | 12,843 |
| Virginia | 87,434 | 52,242 | 72,894 |
| West Virginia | 11,442 | 791 | 7,043 |

The next step in this process will be to develop habitat conservation objectives (acres needed to support these population objectives) would be an assessment of season-long use of regional habitats by waterfowl including birds stopping during migration, but subsequently leaving the region of interest. This total season long assessment can be represented as waterfowl “use-days” or “duck energy days”. The ACJV Gamebird Technical Committee has started but not completed this important step.