



Autumn, 2016

Volume 33, Issue 4

Conserving rare breeds since 1977

THE LIVESTOCK CONSERVANCY™ NEWS

Counting Our Chickens – The Great American Poultry Census

Introduction

Rare and traditional poultry breeds are an important option for small farms, possessing traits such as foraging, maternal ability, disease and parasite resistance, and heat- or cold-tolerance. These are beneficial to niche farmers, especially those using extensive management systems. Each year, the Conservancy publishes its annual *Conservation Priority List (CPL)* listing the livestock and poultry breeds that are in most need of conservation. Status is determined on genetic uniqueness combined with census of breeding populations. Poultry censusing is different than that for mammalian livestock. It requires a much more extensive approach to get a comprehensive picture, because poultry breeds lack the registry framework so common with mammalian livestock. With poultry, the Conservancy contacts hatcheries, known major breeders, and Conservancy members. The Livestock Conservancy also sends out surveys through the American Poultry Association, breed clubs, and the Society for the Preservation of Poultry Antiquities. We try to reach as many people as possible. Through the work of The Livestock Conservancy, no breeds brought onto our CPL have been lost in the United States.

A Need for Information

In 2015 the Livestock Conservancy conducted a census focusing on all Large Fowl Standard Bred poultry, in partnership with the American Poultry Association (APA), Mother Earth News, the Heritage Poultry Conservancy, The Society for the Preservation of Poultry Antiquities, and Tractor Supply Company. This study did

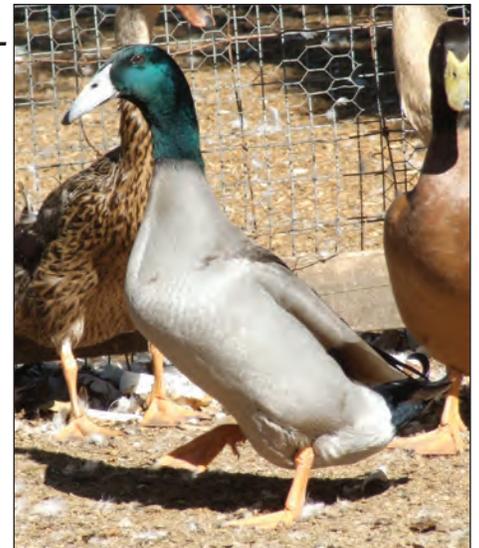


Aylesbury and Dutch Hookbill ducks are now the only remaining ducks listed as critically endangered. Above: Aylesburys; right: Dutch Hookbill drake.

not include bantams unless the breed did not have a large fowl counterpart. Of most interest were the older, original genetic breeds, which were in most cases the large fowl breeds. The term “standard bred” is important, and it means that the emphasis was on birds that are being raised to meet the breed standards of the APA. A few breeds outside of the APA’s lists are also considered to be important as genetic resources and were included.

The census project was funded through a generous donation by Murray McMurray Hatchery in recognition of the importance of understanding how poultry populations are faring in North America.

Many of the breeds surveyed are historically significant and represent irreplaceable genetics crucial to their species and to the future of agriculture. Even as backyard poultry-keeping has become enormously popular in the past decade, many less common or more challenging breeds continue to diminish and are now in real danger of extinction. Exhibition breeders and small



hatcheries often serve as important reserves for such breeds.

The census of chickens, turkeys, ducks and geese began in the spring of 2015 and was completed a year later in 2016. The previous censuses were conducted in 2000 (waterfowl), 2004 (chickens), and 2006 (turkeys). Through our partners and several media outlets, more than four million poultry enthusiasts were reached and

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2016 Top-Rated Nonprofit

The Livestock Conservancy is proud to announce that for the third year in a row we have been awarded the distinction of "Top-Rated Nonprofit" by GreatNonprofits.org. Only the top one percent of eligible nonprofits receive this distinction.

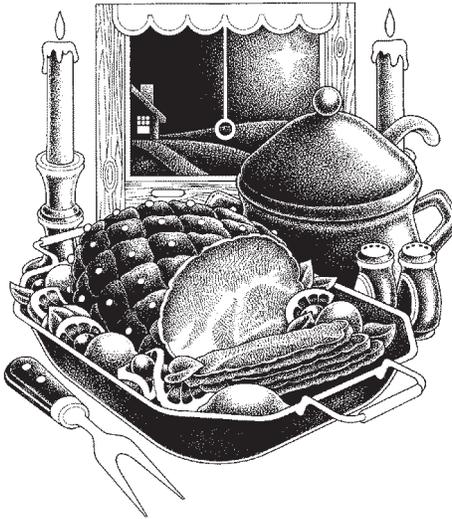
Thank you to all of our members, donors, breeders, followers, and fans of Heritage breeds who make our work possible. The Conservancy and the work we carry out wouldn't exist without you.

To read public reviews of The Livestock Conservancy and leave your own review, visit our profile at <http://greatnonprofits.org/org/the-livestock-conservancy>.

Share Your Heritage Breed Recipes

The Livestock Conservancy is in the process of compiling recipes that use Heritage breed products. These recipes will be posted on the Conservancy's website, shared through social media, and printed in this newsletter. If you have recipes to share that use Heritage breed meat, milk, eggs, lard, or other products, please send us the recipe, including as much of the following information as you can:

- Recipe name
- Recipe creator's name
- Your name, city, and state



- Ingredients list
- Instructions
- Prep time / cook time / total time
- Servings
- The breed, or breeds that can/should be used for the recipe
- A phone number or email (will not be shared) where we can reach you if needed

Mail your recipes to The Livestock Conservancy, PO Box 477, Pittsboro, NC 27312 or email them to rwalker@LivestockConservancy.org.

Welcome to our Newest Life Member!

The Livestock Conservancy would like to give a special thanks to the following individual who recently chose to support the Conservancy and its conservation programs by becoming a life member.

Elizabeth Crain
Duvall, WA

For more information on becoming a life member, please contact Ryan Walker at 919-542-5704, ext. 102, or rwalker@LivestockConservancy.org.

The Livestock Conservancy News PO Box 477

Pittsboro, North Carolina 27312 USA
(919) 542-5704 · Fax (919) 545-0022
www.LivestockConservancy.org
rwalker@LivestockConservancy.org

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Basic annual membership is \$45 and includes the quarterly *Livestock Conservancy News* and the annual *Breeders Directory*. We also accept unsolicited donations. All contributions are tax-deductible to the extent provided by law. Please send changes of address to the Conservancy.

The Conservancy welcomes articles, photographs, letters, and classified advertising for possible publication. Publication of articles or advertisements is not necessarily an endorsement by the Conservancy. Articles from this newsletter

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Ryan Walker, Marketing and Communications Manager

Advisors

D. Phillip Sponenberg, DVM, PhD, Technical Advisor



FROM THE SCIENCE — DESK —

Managing Imported Breeds and Bloodlines

By D. P. Sponenberg

Globalization has changed the world. Not only do manufactured goods manage to circle the globe, but so do animal products. In some cases, so do the animals, and managing breeds in a global setting can be challenging. The goal is to assure long-term viability of breeds and their availability to breeders and producers.

Global exchange of breeds allows breeders and producers to have greater access to animal variation. Breeders have a wider array of choices. These advantages come with some risks, however, even

though greater global access to genetic resources can generally be a good thing. Most breeds are adapted to their homeland, and only rarely does that adaptation translate completely well into their new location. In general, local resources always need to be considered for local production before resorting to imported resources that may have inadequate adaptation.

Imports will always have an inherent attraction to many breeders. This “instant advantage” over the local alternatives means that imports need to be carefully managed to maximize the benefits than can be reaped, while minimizing any potential problems. Keep in mind that these imports are genetic resources, and need to be carefully safeguarded for future generations.

Importation of breeds

One way that imports come in is as completely new breeds that have never previously been in the United States. Breeders and producers will always find these new breeds fascinating because of their novelty. Due to the expense of importation the animals are generally well-documented and come in with expectations of high levels of production.

The risk to local breeds is that the notoriety of the imported breeds works to make them instantly popular. The resulting high demand can then displace local breed resources either through crossbreeding or through outright replacement as the imported breed’s numbers increase. This has happened with goats, where the imported Boer, Savannah, Kalahari Red, and Kiko have significantly eroded the numbers of purebred Spanish goats. Research has now revealed that the Spanish goat breed has several advantages over these others, and

is itself a logical breed choice for many systems. Fortunately these findings, and producer experience, have reversed the slide of the Spanish goat to extinction. This was a very real threat a decade or more ago.

Among Colonial Spanish horse breeds, recent imports from South America come in with high dollar value, and are celebrated for their ability and style. Nearly identical animals can be found among the unique North American populations of the same breed group, most of which are languishing near extinction.

Not all newly imported breeds come from common breeds. Some come to us as animals selected from breeds that are rare in their homelands, and these present their own array of challenges. The imported animals are removed from their country of origin and therefore can no longer contribute to breed survival in that country. If the imports are from rare bloodlines, or otherwise come from unique portions of the breed, their removal can detract from long-term breed survival in the breed’s homeland. This is especially true if the movement of animals is a one-way direction out of the country of origin and never back into it. Breeds, once they become international, need to be managed as international resources. Ideally this means reciprocal exchange of breeding stock among all the countries with the breed, although this is often thwarted by import/export regulations.

In order to assure that imported rarities do have a role in breed survival, The Livestock Conservancy has decided that certain minimum criteria need to be in

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Spanish goat numbers have recently been improving since their decline in previous decades due to the introduction of goats from South Africa and New Zealand. Leicester Longwool sheep have experienced the effects of “popular sire syndrome.”

Managing Imported Breeds and Bloodlines

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place before imports land on the Conservation Priority List. The goal is to provide a profile only for breed populations that have a realistic chance of contributing to breed management and survival. Tiny populations of closely related animals that are all held by a single breeder simply do not fit that criterion.

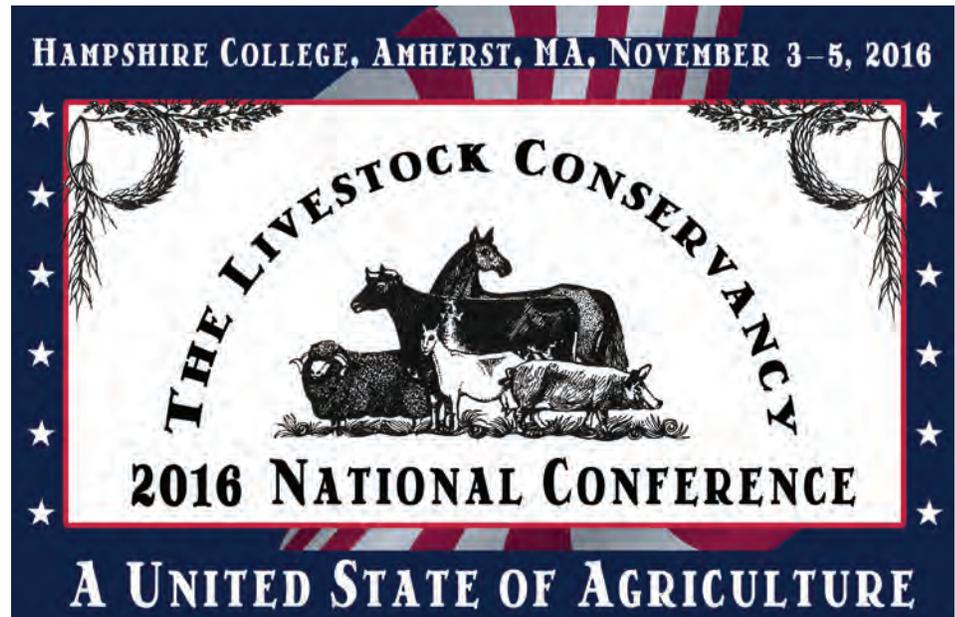
Importation of bloodlines

A second way imports come in is as individual animals or new bloodlines to augment breeds that are already in the United States. These are important for breed management, but also present their own host of challenges.

Much like the “entire new breed” situation, the imports come in with fanfare and notoriety above that typical of home-grown animals. The tendency is for most breeders to want to use the imported animals in their breeding programs. This can be to the detriment of local and unique American bloodlines. Breeders often succumb to the “popular sire syndrome” and use imported sires in preference to American ones.

Several examples can be cited. Ancient White Park cattle were first brought to the United States from England during World War II, in an attempt to assure the breed’s survival in the event that the Germans won the war. These cattle came from the breed before the breed hit a series of genetic bottlenecks, and as a result they were an important portion of the breed. Much later, semen from an imported bull was introduced. This bull was used so widely across the breed that now no animals are completely free of his influence. The earlier American group has all been affected by this one bull. A more logical strategy is to make sure that breeds maintain at least a remnant of the older bloodlines.

Similar challenges are now facing Large Black swine, Dexter cattle, Red Devon cattle, Leicester Longwool sheep, and no doubt others. While imported animals or semen are important for the management of international breeds, it is also important that the uniquely American portions of these breeds be maintained not only for American use, but also as a repository of unique bloodlines that some day may serve the international breed.



There’s (Probably) Still Time!

If you haven’t registered for the National Conference in Amherst, Massachusetts on November 3-5, you probably still have time. As this newsletter goes to press we still have some space available, although it is filling up very quickly. To see if there is room left to attend, visit LivestockConservancy.org and click on the link from the homepage, or call us at 919-542-5704. We’ll be in the office through October 28 if you need to call.

Don’t miss the expert speakers; hands-on, skill-building intensives and tours; great networking opportunities; and, of course, our famous local, sustainable meals with heritage breed products.

Location: Hampshire College, 893 West St, Amherst, MA 01002

Keynote speaker: Tom Beeston, CEO of the U.K.’s Rare Breeds Survival Trust

One positive outcome of imported bloodlines is their use in re-invigorating rare breeds that have hit a genetic bottleneck. The initial results of using imported sires in this situation is likely to be dramatic. Even in this case, though, back-crosses to the original bloodlines for a generation or two are a useful strategy to maintain a healthy majority of original breeding in what are now vigorous, productive animals. This assures their contribution to the breed’s future, rather than slowly eliminating them through repeated crosses to imported genetics.

In most cases it is wise to use newly imported bloodlines to establish groups in

Kickoff Banquet & Silent Auction:
6pm, November 4

Members Meeting: 5pm, November 5

Fees

Registration: Members - \$195, Nonmembers - \$240

Pre-Conference Clinics

8:00-11:30 am

- * Value Added Products with Rare Breeds - \$69
- * Raising Dutch Belted Calves for Sale - \$69
- * Breed Association – Routes to Success (Part 1) - \$29

1:30-5:00 pm

- * Breed Association – Routes to Success (Part 2) - \$29
- * Micro Dairying - \$69
- * Sheep Artificial Insemination - \$69

which this breeding predominates (to the level of 15/16 or higher). This essentially establishes a new and distinct bloodline within the American population which can be used to good advantage to complement the unique and old American lines. In that sense, these simply add to the variations possible in the American breed, rather than replacing it wholesale. At the same time, it is good breed management to assure that older and unique American bloodlines are also treasured and maintained. Breeders then have long-term availability of both types for future management of the breed. ❖

Ray Clark and American Milking Devon Cattle

By Drew Conroy

Many breed associations have long-time breeders, with interesting histories related to the breed. The American Milking Devon Cattle Association (AMDCA) has Ray Clark of Lyndonville, Vermont. Anyone who has met Ray in person or talked to him on the phone knows that he likes meeting people. While he can talk about politics, cattle, oxen, haying, equipment, and many other topics, when he talks about Devon cattle his enthusiasm is infectious and his passion for the breed is obvious.

I have traveled the world talking to people raising cattle. Ray Clark has influenced the breed by helping others get started, especially in finding cattle. He seems to know everyone that is selling cattle and can usually talk at length about the quality of their stock. Ray has offered advice to many about raising Milking Devon cattle and as a long-time breed association member, has a history with the breed that is valued by many.

Sitting in his one-ton truck in his cattle pasture, as the sun was setting on an especially warm Labor Day weekend, it didn't take much to have Ray talk about his lifelong passion for this breed. We spoke for hours. As the sun dropped below the nearby mountains, the mosquitoes came out with a vengeance. The mosquitoes did not stop Ray, and I think he would have spoken all night about his family history, the farm, and why he has Devons.

Ray Clark grew up in Essex, Connecticut; he proudly described how his family had been in Connecticut since the early 1600s. He completed a dairy science degree at the University of Connecticut in 1959. His family always had Devons, but after graduating from college he went with an all-Guernsey dairy herd. He milked 15-20 cows, "peddled milk," had chickens, 8-10 sows, and even a small slaughterhouse. The Devons, which had been in the family a long-time went to Diurna Kibby, because at that time the Devons weren't worth anything.

After a few years of raising Guernsey cattle and selling milk at \$3.50/cwt. Ray couldn't make ends meet so he went to work at the Pioneer Farm, a dairy farm, in Old Lyme Connecticut for \$60/week. He worked seven days a week, 365 days a



Ray Clark and his American Milking Devon cattle. Photo courtesy of Drew Conroy.

year. He hired two guys to take care of his own Guernsey herd, and his outside job helped support both himself and his herd.

His father was in the oil business, and Ray had learned a thing or two about oil furnaces and boilers. So he later went to work for Standard Oil, did some consulting, had an industrial oil boiler business. He also had a construction business and even did some dynamite blasting.

In 1981 Ray moved to Lyndonville, Vermont, where his father had a farm and was raising dairy heifers and Guernsey cattle after he retired from the oil business. It was about that time that Ray decided he wanted to again have some Devons.

His reintroduction to Devons started with the purchase of one heifer from Diurna Kibbe in Connecticut. A few years later, he bought three more, two cows and a bull. Some of his current stock are the granddaughters and great granddaughters of those animals. He has only brought in three outside bloodlines, one bull he bought from Gurney Davis, a bull he borrowed from Bruce Farr in New Hampshire, and a bull he borrowed from Cyril Green, in Connecticut. Over time all the offspring from the first two bulls have been sold from the herd. His best stock goes back to Cyril Green's bull.

Cyril Green maintained a Milking Devon herd for many years, just off the University of Connecticut campus in Storrs. His herd was well known for producing some of the best bull calves used for oxen. A number of breeders have managed to convince him to sell them some heifers and bull calves for breeding, but Cyril was very particular about who he sold animals

to, and the bull calves usually left his farm castrated.

Ray told me a story of trying to get Cyril to part with a bull named Napoleon. "I really wanted to borrow or buy the Napoleon bull Cyril owned," said Ray. "Cyril was visiting me here, and wanted to buy 2 of my yearling bulls. We started dicker-ing at 10 am, and argued until 4 pm. Cyril bought lunch, and we got within \$5 of each other on price." Ray finally negotiated to borrow the bull for two years, as long as Ray bought Cyril the diesel fuel to truck the animal up from Connecticut. Ray agreed and shortly after he finally had the bull.

According to Ray, a year or so later, Cyril was ill, and thought he was dying. He had moved to Pittsfield, Maine and decided to sell all his cattle. Many of them he shipped for beef, but Mark Winslow of Falmouth, Maine had befriended Cyril and bought a few of his animals. At this time Ray had the bull for three years, but Cyril was okay with Ray keeping him, "because the bull was being fed and well taken care of." Commented Ray, "That Napoleon bull was here for many years, and had to be near 20 years old, when he finally went back to Cyril in Maine."

Ray described Napoleon as one of the best bulls the breed has had. Most of his stock today are related to Napoleon. He has generated lively discussions at the annual meetings of the American Milking Devon Cattle Association about the advantages of line-breeding and/or inbreeding. Ray has stated that when you have stock with the kind of genetics and qualities you

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Roy Clark

Continued from previous page

want to perpetuate in your herd and you cull hard, eliminating inferior animals, inbreeding is not always a problem.

It is worth noting Ray's system of herd management. In part, it is historic and in this day and age, unique. His animals are tied all winter in a three-story hillside barn on a wooden floor. The manure drops through to the cellar through a scuttle, and the hay is above the animals. Ray notes that his system allows the cattle to be handled and tied from birth.

Ray likes the Devons in part because they are easy keepers. "They'll get fat on a flat rock, and you can't kill them with an ax," at least that was what the old timers used to tell me," he chuckles.

Ray feeds no grain and supplements his pasture and winter hay with just salt and a custom mineral. The cows come in from pasture at the end of November or December. His pasture management system is pretty basic: cattle have constant access to some hillside pastures, and when his second-crop hay is harvested, the cattle later get access to some of those fields.

He wants everything to "harden up" or freeze before the cows come in the barn for the winter. When the cattle come in, they are all tied in the barn, and if the calves were nursing, they are weaned once the cows are tied up. At that time he feeds second-crop hay. "I want to make sure they get enough to grow a calf." Just



American Milking Devon. Photo courtesy of Drew Conroy.

before bagging up in the spring, he feeds them his coarse hay from the first cutting. He does not want the cattle producing too much milk, as the farm milks only a little for their own use and otherwise lets the calves nurse.

"This past winter I fed second-crop [hay] all winter, and we had cows come down with mastitis," says Ray. "Next year we are going back to the coarse stuff just before calving. There is no need for them to produce more milk than the calves need, under his system of management.

Ray tries to calve between the first of April and the middle of May. The cows give birth in the barn in a box stall. He leaves them in the stall for two to three days, and then the cow gets tied up. The calf gets tied up behind the cow and gets to nurse twice a day.

Ray comments, "All my cattle are tied up just after they're born for at least a few weeks, and the yearlings and cows are tied all winter. At that time I run my hand over the heifers' udders, so when they come in, if they have too much milk, we won't have too much trouble milking them. We will milk the cows once a day, and take what we need from the heavy producers and let the calves have the rest."

Ray's cattle go out to pasture somewhere between the first and fifteenth of June. I asked if by that time in the season they are anxious, to go out to pasture. Ray answered, "You have to drive them out, and sometimes they come running back into the barn and stand in their stalls."

"The pasture is pretty lush in Vermont by June, but the first thing they seem to do on the pasture is to eat the brush," notes Ray. "I have put cows out earlier and even calved a few out the in field. But the calves don't get handled and coyotes here are a real problem. Some of my neighbors have even lost cows to bears. So I just like to make sure the calves are not going to be easy targets before letting them out."

As the sun went down, and Ray's grandson came out to call him into the house for dinner, Ray proudly introduced him to me. He had him show me the ribbons he had recently won at the Caledonia County Fair with his American Milking Devon cattle. Ray hopes his grandson will continue the Clark family tradition of raising Devon cattle, likely one of the oldest family traditions of raising any breed in the United States. ❖

In June 2015, a great video about the

Milking Devon breed featuring Ray Clark and others was produced by the University of Vermont Extension, on their program "Across the Fence." This can be seen at www.youtube.com/watch?v=hAckr4wnzt0

Long-Time American Cream Draft Horse Secretary Passes Away

Karene Margil (Bunker) Topp, born June 15, 1928 near Salem, Iowa, passed away on July 16, 2016 in Iowa, at the age of 88.

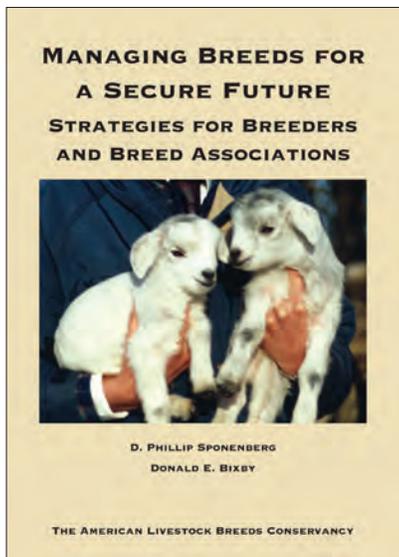


Karene loved horses, especially American Cream Draft horses, the only draft horse breed developed in America. She was the first secretary of the American Cream Draft Horse Association and served in that capacity for 40 years. In recognition for this service she rode in a wagon drawn by a team of Cream horses in the Rose Parade in Pasadena, California, in 1996.

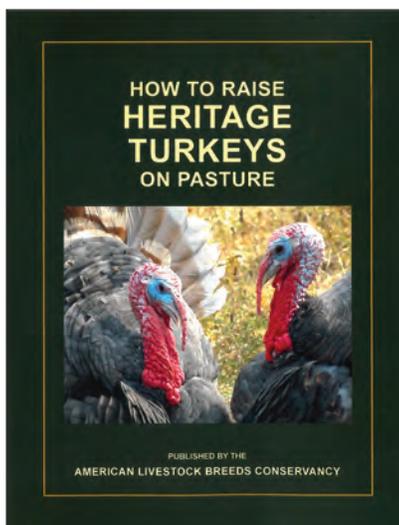


Suzette, member Sarah Gruen's Dominique hen, won first place and Champion at the Baltimore County 4-H Fair. She taught many visitors about her breed, and they enjoyed seeing the brown eggs she laid too.

Top Books for Holiday Gifts



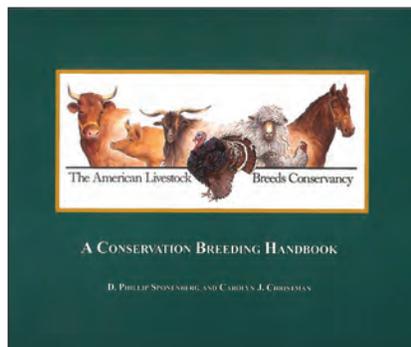
Managing Breeds for a Secure Future
By D. Phillip Sponenberg and Donald Bixby, \$22.95. Addresses the many challenges of maintaining genetic diversity within species and breeds of domesticated livestock and poultry. Both a theoretical exposition and a user's guide, it examines conservation issues and provides practical approaches for developing successful strategies for securing both standardized breeds and landraces.



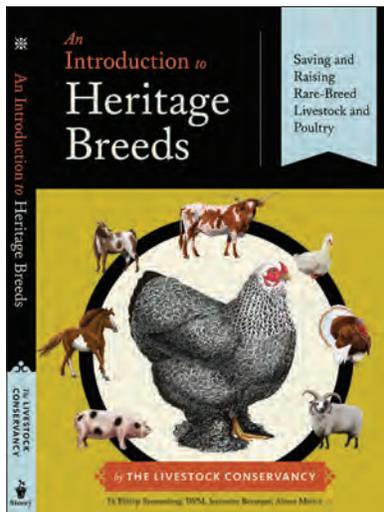
How to Raise Heritage Turkeys on Pasture

By The Livestock Conservancy, \$14.95. This modern manual for Heritage turkeys pulls together the best of historic production information appropriate for Heritage turkeys and the best of modern health management. It addresses production from poult to processing, and marketing from packaging to distribution. The end of each

chapter contains a rich resource list for more information.

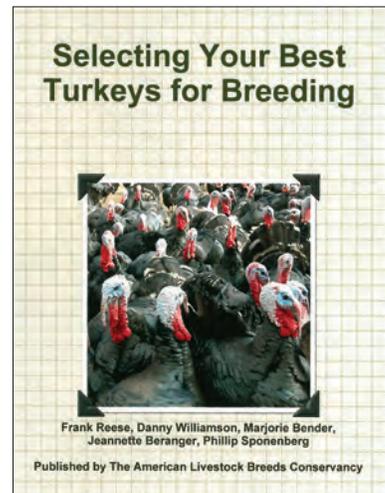


A Conservation Breeding Handbook
By D. Phillip Sponenberg and Carolyn Christman, \$15.95. Explains the importance of livestock and poultry breeds and describes how individual breeders can be stewards of these genetic resources.



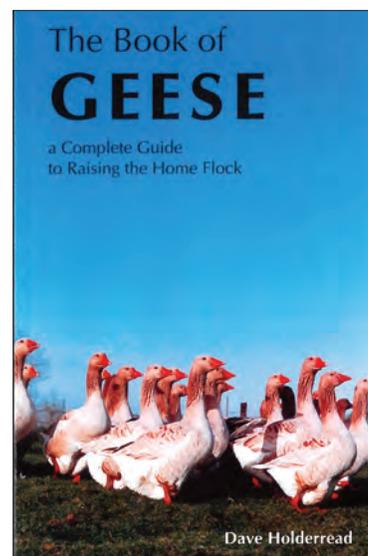
An Introduction to Heritage Breeds
By D. Phillip Sponenberg, Jeannette Beranger, and Alison Martin, \$19.95. Heritage breeds matter, and they are often a better choice than conventional breeds for small farms and backyards. This eloquent, inviting, visual guide explains why conserving heritage breeds is important and shows how you can raise these breeds yourself, helping to preserve them and benefiting from them at the same time.
Note for Professors: If you would like to use *An Introduction to Heritage Breeds* as a required text for your class, please email athompson@LivestockConservancy.org.

Order online at LivestockConservancy.org or mail payment to The Livestock Conservancy, PO Box 477, Pittsboro, NC 27312. Shipping Rates: \$6 shipping for total up to \$20. Add \$1 shipping for each additional \$10. (e.g., \$25=\$7, \$33=\$8, etc.) International: add \$15 to shipping amounts. Please call 919-542-5704 for orders over \$100.



Selecting Your Best Turkeys for Breeding

By The Livestock Conservancy, \$9.95. As part of its Master Breeder program, the Conservancy has worked with several renowned turkey breeders to develop this guide. Learn from the experts how to select and evaluate birds.



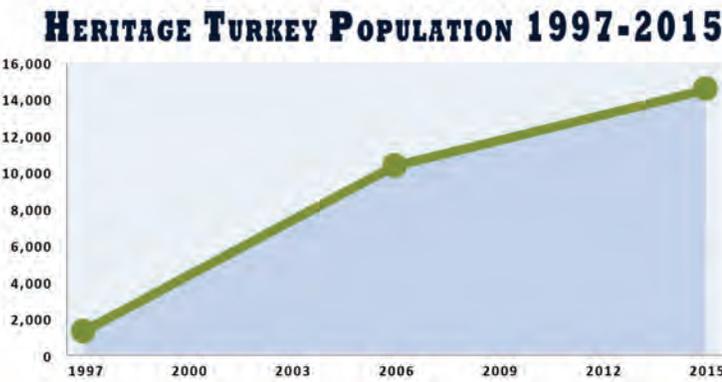
The Book of Geese

By David Holderread, \$17.00. Basic enough for the hobbyist, yet comprehensive enough for commercial raisers. Twelve informative chapters covering the usefulness of geese, their limitations, external characteristics, behavior, the breeds, getting started, incubation, rearing goslings, managing adult geese, diagnosing diseases, sexing and butchering, along with 11 appendices on topics from symptoms of deficiencies to a hatchery guide, plus 21 feed rations formulated specifically for geese.



CONSERVATION OF POULTRY GENETIC RESOURCES MAINTAINS GENETIC DIVERSITY, WHICH SERVES AS AN INSURANCE POLICY AGAINST FUTURE CHANGES IN ENVIRONMENT, PRODUCTION SYSTEMS, OR CONSUMER PREFERENCES.

# BREEDS					CRITERIA
MORE SECURE	1	5	3	15	HIGHER THAN PREVIOUS CENSUS
LESS SECURE	2	0	0	6	LOWER THAN PREVIOUS CENSUS
CRITICAL	1	2	4	11	< 500 BREEDING BIRDS
THREATENED	3	4	3	11	< 1,000 BREEDING BIRDS
WATCH	4	6	4	21	< 5,000 BREEDING BIRDS
RECOVERING	0	1	0	6	< 10,000 BREEDING BIRDS



- 22% OF BREEDS BETTER OFF
- # OF DUCK BREEDS CRITICALLY ENDANGERED: 6 IN 2000; 2 IN 2015
- HALF OF ALL POULTRY BREEDS NOW HAVE MORE THAN 1000 BREEDING BIRDS
- 21% OF POULTRY BREEDS REMAIN CRITICALLY ENDANGERED

READ THE FULL REPORT AT LIVESTOCKCONSERVANCY.ORG

Poultry Census

Continued from page 1

asked to participate in the census. As a result, we received completed censuses from approximately 1,500 private breeders, 48 hatcheries, and 8 universities.

Poultry Census Results

The status of poultry breeds improved overall, with 22% of breeds more numerous than when last censused (Page 8). More than half of all poultry breeds had more than 1,000 breeding birds, making them far more secure than before. However, six chicken breeds and two turkey varieties were less numerous, and 21% of poultry breeds had fewer than 500 breeding birds. Changes in ducks were especially encouraging, because fewer farms raise waterfowl than chickens and turkeys, and therefore the inherent risks to duck breeds are higher.

Popularity of backyard chickens in recent years is well documented (Block, 2011; Lucas, 2014), and undoubtedly was an important factor in improvements to the status of chicken breeds. Popularity of dual purpose breeds grew, including many breeds in the American and English classes (Table 2). Brahma and Cochins also gained in popularity. Not all breeds benefited from this phenomenon, however. Breeds that lost ground were of more extreme phenotype and temperament, most notably Old English Game, Malay, and Aseel. These breeds are not popular for egg or meat production and the need to keep male birds separated from each other is not desirable on many small farms. Houdan, La Fleche, and Sebright bantams are also less numerous than in 2004. Somewhat surprising is the relative lack of popularity of Mediterranean-class birds. Although they are excellent layers and efficient at feed conversion, their high-strung temperament and white eggs may

make these breeds less popular for small farm and backyard poultry owners, who tend to focus on breeds that are more calm and personable and that lay brown eggs.

Two chicken breeds graduated from the *Conservation Priority List* with the results of this census: Orpington (English class) and Wyandotte (American class). Both benefited greatly from the popularity of small flocks for backyard egg production. Orpingtons have proven especially popular with families due to their gentle temperament, while Wyandottes have many appealing color varieties.

American game birds were included in the census for the first time. Game birds are a unique genetic resource, distinct in many ways from nearly all standardized breeds and often with pedigrees dating back centuries. The reported numbers indicate the breed is endangered but it is believed that this is due to a very low percentage of these birds being reported. It is planned to study them further at a later date.

The 2015 census points to continued overall success for Heritage turkeys. The first census of turkeys, conducted in 1997, found only 1,335 breeding Heritage turkeys. The Livestock Conservancy then launched a recovery project to recruit more breeders, and partnered with a number of organizations to develop a seasonal market for Heritage turkeys as a high-quality, high-value option for the holiday table. In 2006, breeding turkeys had risen to 10,404, and in 2015 to 14,502. The population of Heritage turkeys now is much more stable, but conservation is still necessary. Attention to varieties ensures diversity within this breeding population, and varieties that represent differences in size and conformation are especially important (Royal Palm, Beltsville Small White, and Midget White). Two varieties, Black and Royal Palm, have declined in

continued on next page

Table 2. Popularity of chicken breeds by class in 2015 poultry census.

Breed Class	Breeding population (Mean breeding birds per breed)	Private Breeders (%)	Hatcheries (%)
American	6740	22	78
English	5910	18	82
Asian	5129	23	77
Continental	2347	25	75
Mediterranean	1876	26	74
All Other Standard Breeds	1890	28	72

Parameters of Poultry Breeds on the Conservation Priority List

Poultry breeds on the Conservation Priority List generally conform to certain genetic and numerical parameters.

- The breed is from one of the four traditional U.S. poultry species (chickens, ducks, geese, and turkeys).
- A bantam breed may be listed if there is no large fowl counterpart.
- The breed census satisfies numerical guidelines:
 - » **Critical:** Fewer than 500 breeding birds in the United States, with five or fewer primary breeding flocks (50 birds or more), and estimated global population less than 1,000.
 - » **Threatened:** Fewer than 1,000 breeding birds in the United States, with seven or fewer primary breeding flocks, and estimated global population less than 5,000.
 - » **Watch:** Fewer than 5,000 breeding birds in the United States, with ten or fewer primary breeding flocks, and estimated global population less than 10,000. Also included are breeds with genetic or numerical concerns or limited geographic distribution.
 - » **Recovering:** Breeds that were once listed in another category and have exceeded Watch category numbers but are still in need of monitoring.
 - » **Study:** Breeds that are of interest but either lack definition or lack genetic or historical documentation.
- The breed is a true genetic breed (when mated together, it reproduces the breed type.)
- The breed has had an established and continuously breeding population in North America since 1925. Or, if imported or developed since 1925.
- The foundation stock is no longer available.
- Must meet numeric guidelines for inclusion.
- Must have at least five breeders in different locations in the United States.
- The global population is threatened and the United States population is making a contribution to conservation of the breed.

Poultry Census

Continued from previous page

number since 2006.

In 2000, six breeds of ducks had fewer than 500 breeding birds; in 2015, this fell to two breeds of ducks. Although not nearly as popular as chickens, ducks have benefited from the trends for poultry rearing. There are only a handful of commercial hatcheries raising waterfowl, and 37% of censused breeding ducks are in private breeder hands, compared with 25% of censused breeding chickens. In recent years, ducks have established a foothold in the marketplace for local meat and eggs.

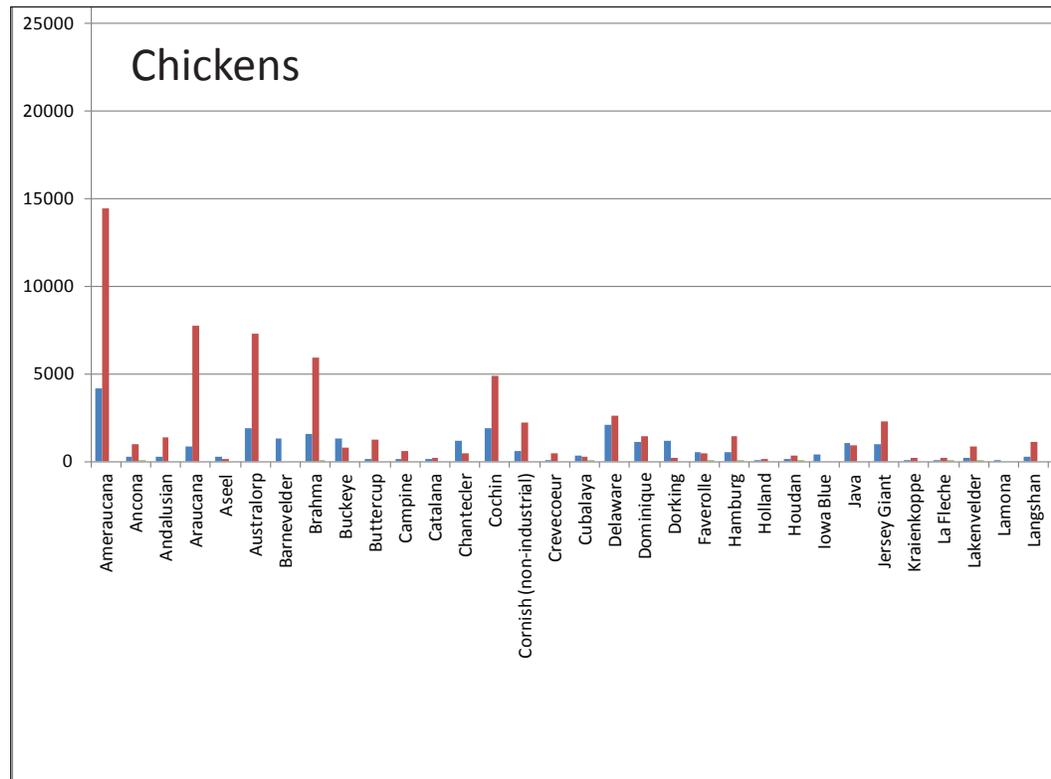
Breeding numbers of geese, on the other hand, declined overall. The number of hatcheries advertising domestic ducks and geese in 2015 was about a third of what it was in 2000, and this may have been an important factor in the decline of geese. Three breeds of geese, Pilgrim, Pomeranian, and American Buff were more numerous in 2015 than in 2000. African and Chinese geese, however, while still in the Watch category, had about 50% fewer breeding birds than found in the previous census. This mixed outlook for geese warrants more conservation attention.

Overall, the results from the 2015 census of poultry indicate favorable trends, and provide the evidence base for conservation decisions in coming years.

Poultry Conservation – What is a Breed?

Since the mid 19th century, poultry breeding practices have diverged from those of livestock, and these differences pose important considerations for conservation of genetic diversity. The dual influences of exhibition breeding and commercial hatchery production have emphasized phenotype over genotype without necessarily including the steps of foundation, isolation, and selection that are so key to breed development. In many poultry breeds the result has been that varieties within breeds, and flocks within varieties, do not share histories of foundation, isolation, and selection with one another. For example, White, Buff, and Partridge Chantecler chickens each come from a different foundation, even though the final products resemble each other in all but color.

Two long established practices of poultry breeding confound the expectation of a “breed”. The first is the extensive



use of outcrossing and backcrossing. It is not unusual for breeders to cross out to other breeds (rather than to other lines within the same breed) in order to bring in desired traits, followed by a few to several generations of backcrossing to fix the trait in question. This is done with some degree of phenotypic selection during the backcross generations. Poultry breeders also place tremendous emphasis on color, and colors are maintained as separate varieties within the various breeds. When breeders outcross, it is often the case that they will cross out to other breeds rather than to color varieties within the same breed, for fear of confounding the fine details of color as demanded by the standard for the variety.

Thus selection plays a dominant role in poultry breeding, with foundation and isolation often playing minor roles, and in many situations playing no role at all. To further confuse the issue, some breeders remain devoted to the concept and practice of pure breeding. At the extremes, these two breeding philosophies yield quite different genetic products, and yet these go by identical names.

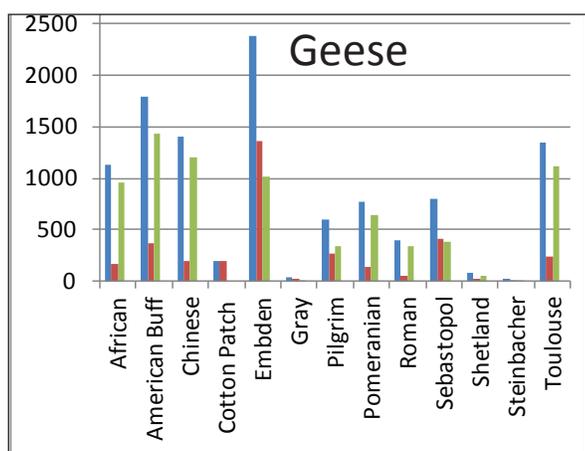
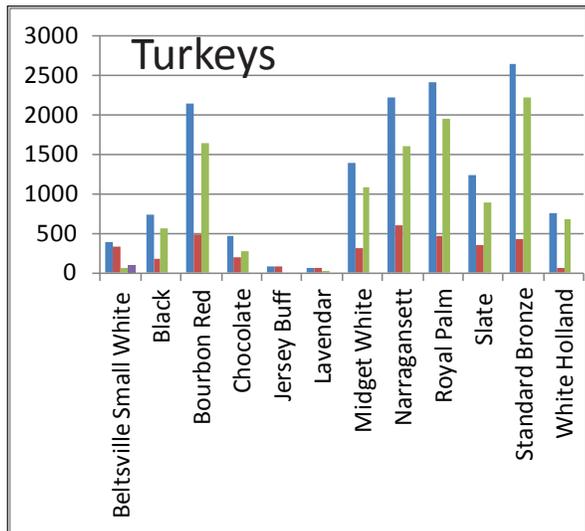
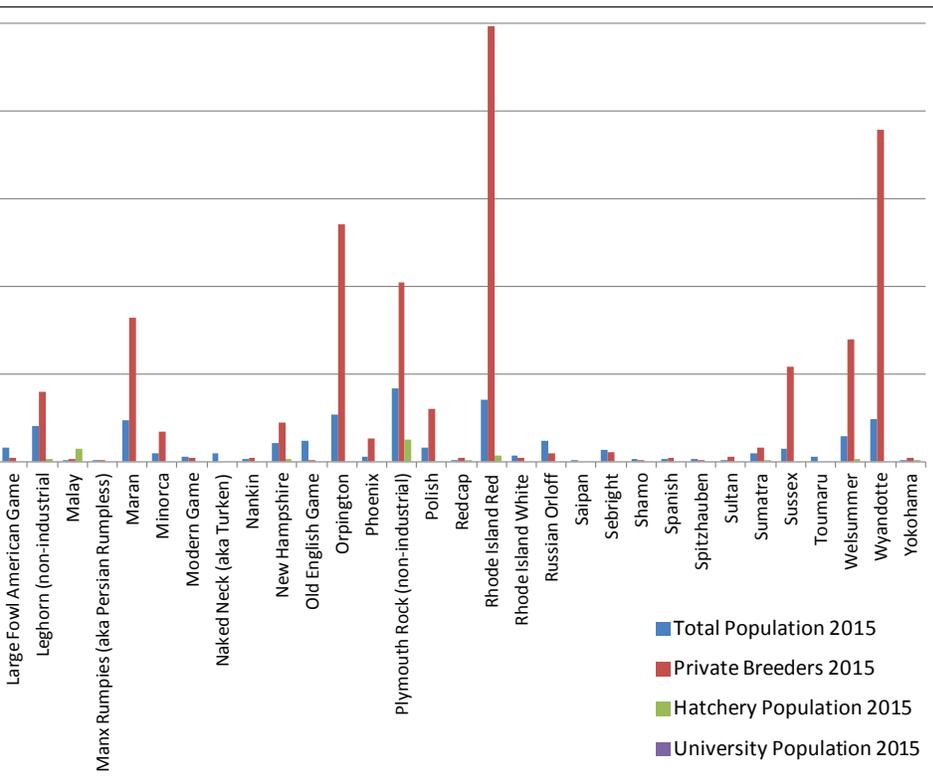
Selection metrics and goals also differ among breeders, with an especially sharp division between hatcheries and exhibition breeders. The former place greater emphasis on egg production (addressing their economic needs) and the latter a

greater emphasis on morphology (addressing the requirements of exhibition). Nearly all these breeders utilize outcrossing from time to time to introduce or strengthen specific traits, especially egg production, and less expert breeders may rely excessively on outcrossing and backcrossing.

These breeding practices do change the underlying genetic importance of the breed, and have a fundamental impact on conservation decisions. In true genetic breeds, epistasis and linkage have a proportionally greater influence on phenotype. Outcrossing can disrupt these, perhaps most importantly for adaptive traits. If poultry breeds are subject to frequent outcrossing, is “breed” the right unit for conservation of genetic diversity? In the absence of a shared history and genotype, conservation may be reduced to single genes and traits.

Breed Value

The greatest value of breed conservation in poultry may therefore reside in breeds with extreme phenotypes. Breeds such as Sumatra, Cornish, Brahma, and Langshan have phenotypes that would be so disrupted by crossbreeding as to make it difficult to return to the original phenotype by backcrossing. There is likely to be more genetic diversity between such extreme breeds than between breeds of more intermediate phenotypes, such as popular dual purpose breeds within American and



English classes.

Landrace breeds represent another aspect of genetic diversity of high value for conservation. For example, Icelandic chickens imported in this century come from a hardy landrace that is being conserved in its native Iceland. Phenotypic differences in comb type, color, and even partial crests on some birds may disturb breeders accustomed to the phenotypic uniformity of standardized breeds. Yet, these birds resemble each other more than any other breed, not only in appearance, but in traits prized on the small farm such as foraging, brooding, care for chicks, and cold hardiness.

Waterfowl present a different breeding model than chickens, and are more likely to be maintained as purebred populations. Thus, conservation of breeds remains a viable model for ducks and geese. Turkeys present yet another scenario, because breeds as such are not recognized. Indeed, genetic diversity in turkeys is low, and standard-bred (Heritage) varieties are more closely related to each other than to commercial varieties (Kamara et al., 2007; Aslam et al., 2012). This, rather than breeds or varieties, provides the most useful distinction for conservation, because standard-bred turkeys are also less numerous than commercial broad-breasted varieties.

Conclusions

Breeds remain relevant as a unit of conservation for ducks, geese, landrace chicken breeds, and for chicken breeds with extreme phenotypes. In the sense that standard-bred turkeys may be considered to be a distinct breed from broad-breasted commercial turkeys, breed is also relevant to turkey conservation. For these breeds, the conservation model that has worked well for livestock may be applied, and recommendations for poultry conservation summarized roughly as:

- Save the really rare stuff
- Save the really old stuff
- Save landraces
- Save extreme phenotypes
- Save non-industrial turkeys, ducks and geese
- Keep tabs on all of it

Breeding strategies for rare breeds need to maintain genetic diversity. This is best accomplished by maintaining purebred flocks. Using more males than are strictly needed for fertility, long term strategies such as “spiral breeding” and

alternating roosters from within strain and across strains all serve to maintain genetic variability within the flock (Sponenberg & Bixby 2006). Selection to improve productivity and adaptive traits can be combined with conservation breeding which enhances the value of these birds on small farms, bearing in mind that the need to conserve diversity may slow selection

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Poultry Census

Continued from previous page

progress. At the breed level, maintaining different bloodlines within a breed, usually on different farms, also ensures diversity. Assuring genetic transfers among small-farm breeding flocks is also important, otherwise these flocks simply become extensions of hatchery flocks with little to no independent contribution to the future genetics of the breeds.

The conservation picture for chicken breeds of intermediate phenotype remains complicated. They are sufficiently different from broilers and commercial Leghorns to be of conservation interest, yet the breeding strategies employed lead the geneticist to wonder whether these breeds differ significantly at the genetic level. Together, they fit a similar ecological niche and can serve as a reservoir of rare alleles while also filling a niche for backyards and small homesteads. The next step is to conduct genetic distance studies. The Livestock Conservancy has joined with numerous scientists to collect DNA samples to address these questions.

Cryoconservation represents another important facet of breed conservation. By building a library of conserved breeds, and then adding to this library at timed intervals, evolving changes in poultry genetics are preserved for future research as well as being a source of genes or gene regions. Reconstitution of individual birds has been demonstrated (Song and Silversides, 2007a; *ibid* 2007b), and additional progress in understanding the obstacles to frozen semen recovery have been made (Long, 2016), but much work remains to be done before we can rely upon frozen conservation for reconstitution of poultry breeds, and *in vivo* conservation will always be needed in parallel as breeds



change and adapt to current needs.

Conservation of poultry genetic resources maintains genetic diversity, which serves as an insurance policy against future changes in environment, production systems, or consumer preferences. Determining the best way to effectively conserve genetic diversity is challenging. Presently the most realistic strategy is to target breed conservation, despite some drawbacks to this approach based on the breeding practices around these breeds.

The Livestock Conservancy would like to recognize the efforts of all of our partners for reaching poultry producers across the country. We would also like to give special thanks for financial support to Murray McMurray Hatchery, without whom the census would not have been possible. ❖

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Board Elections – Vote Now!

Richard M. Blaney is a Floridian with a Bachelor's degree from Florida State University and Ph.D. from Louisiana State University. "Looking back over seven decades," comments Richard, "life has been an adventure, and always interesting. During the early part of life, I was a student and science was my passion, my lifestyle, and that has never changed. I have my list of accomplishments, many publications, degrees, etc., but I am still a student. I traveled throughout the United States, Mexico, and the Caribbean doing field studies and lab research in comparative vertebrate anatomy, primarily specializing in herpetology. I have been deeply involved with environmental issues and endangered species. Later in my career, I eventually concentrated on teaching courses for allied health students, in human anatomy and physiology. I designed and taught online courses, but absolutely prefer teaching face to face. I wrote lab manuals and study guides for these courses. I even did a television series with 14 one-hour episodes, "*Survey of Anatomy and Physiology*." I also served as Department Chair, a demanding and thankless job. I retired in 2006 and moved from central Florida to a more isolated area in north Florida with plenty of room. Hence began my third phase of life as a rancher. I am now dedicated to preserving Galiceño horses, a critically endangered breed of Colonial Spanish horse, at our horse ranch, Galiceños of Suwannee, in Suwannee County, Florida."



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Richard Browning, Ph.D. is a Professor of Animal Science at Tennessee State University in Nashville. He grew up in Raywood, Texas where he was active in the Hull-Daisetta FFA and Liberty County 4-H through the raising and showing of Red Brahman cattle. He earned a B.Sc. from Prairie View A&M University and M.Sc. and Ph.D. from Texas A&M University. Dr. Browning's graduate research focused on the reproductive performance of Brahman cattle and comparative calf performance of tropically-adapted Tuli cattle along with Angus and Brahman. In 1994, Dr. Browning came to Tennessee State University in Nashville, where he studied physiological mechanisms and heat-tolerant cattle genetics in relation to fescue toxicosis using Angus, Brahman, Hereford, Holstein, and Senepol breeds. He started meat goat research in 2002 and is studying performance traits among Boer, Kiko, and Spanish breeds. Myotonic and Savannah goats were added later to the research program. Dr. Browning established a Dexter cattle herd at TSU in 2015. The Dexter cattle will be used to advance student teaching and ruminant research. He is married to Dr. Maria Leite-Browning who is a veterinarian and Extension specialist, and both are thoroughly engaged in outreach activities to assist meat goat producers.



Isabela Castaneda grew up in Mexico City, where she was very involved and passionate about her dogs and horses. She got her bachelor's degree in Economics in Mexico and worked at the Mexican Finance Ministry as an assistant to the Undersecretary of Finance, and later got an MBA in Finance at Yale University. After working for a short time as an investment banker, she moved to Washington, DC, where she spent the next 15 years at a management consulting firm, first as a Research Fellow



and later as a Program Manager in the areas of statistics, econometrics, and survey research.

In 2012, she became a full-time, stay-at-home mom and moved with her husband and two young children to Richland Center, Wisconsin to start a farm using sustainable agricultural practices. Currently they raise Romeldale CVM sheep. They also have four guard llamas, two horses, two dogs, three cats, chickens, and guinea fowl. Isabela has served as President of the National Romeldale CVM Conservancy since January 2015.

Kelli Dunaj grew up in the rural South, and attended Virginia Commonwealth University in Richmond and George Mason University in Fairfax, Virginia. After graduating with a B.A. in English Literature, Kelli moved to San Francisco, California, where, after a couple of years in the tech industry, she began working at the corporate headquarters of Williams-Sonoma, a retailer of high-end cookware, cooking utensils, kitchen décor, and gourmet foods, where she was ultimately Director of Retail Distribution for the Williams-Sonoma brand. In 2007 she resigned to focus on raising her son full-time.



Kelli, her husband, Ken, and their nine-year-old son moved to a 210-acre ranch in Marshall, California, near Point Reyes National Seashore. In 2013, Kelli immediately set out to create an agricultural plan that would bring the place to life as a real "family farm" without adversely affecting the sensitive ecosystems found in the coastal zone. Early in the planning process Kelli discovered The Livestock Conservancy and became a lifetime member. The mission of the Conservancy and their list of heritage breeds became the blueprint for the ranch and how to select the right livestock for her farm. Through the Conservancy Kelli discovered Navajo-Churro sheep. She is a passionate supporter of the Churro and an active member of the Navajo-Churro Sheep Association. She currently runs a flock of more than 80 ewes and rams from several genetic lines and sells wool products, meat, and breeding stock

to other farmers. In 2015 she expanded her marketing vision to create a "heritage farm box" including Navajo-Churro lamb, whole Delaware chicken, Native Shorthorn beef, heritage breed rainbow chicken eggs, and her own organically-produced olive oil. Products are sold direct-to-customer and at the Point Reyes Station Farmer's Market.

Kelli is eager to support the mission of The Livestock Conservancy and share her experience bringing heritage products to market.

Andrew Heltsley currently serves as the brand manager for Old Dominion Freight Line. Previously, Andrew worked on national marketing efforts for Tractor Supply Company where he began his involvement with The Livestock Conservancy and his passion for heritage livestock. In addition to his marketing experience, he brings a history of service to the nonprofit community including work with the boards of the Tennessee Conservation League, Nashville Area Junior Chamber of Commerce, and the Spirit of Blue Foundation. Andrew lives with his wife and two children in Oak Ridge, North Carolina.

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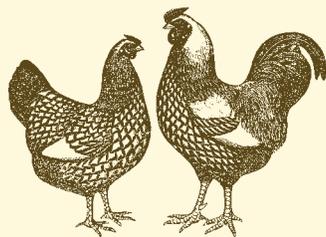


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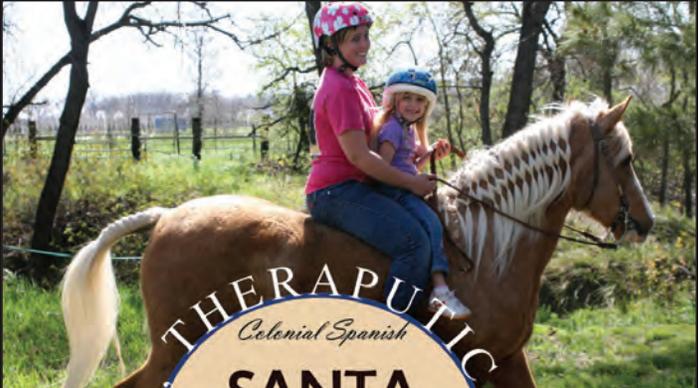
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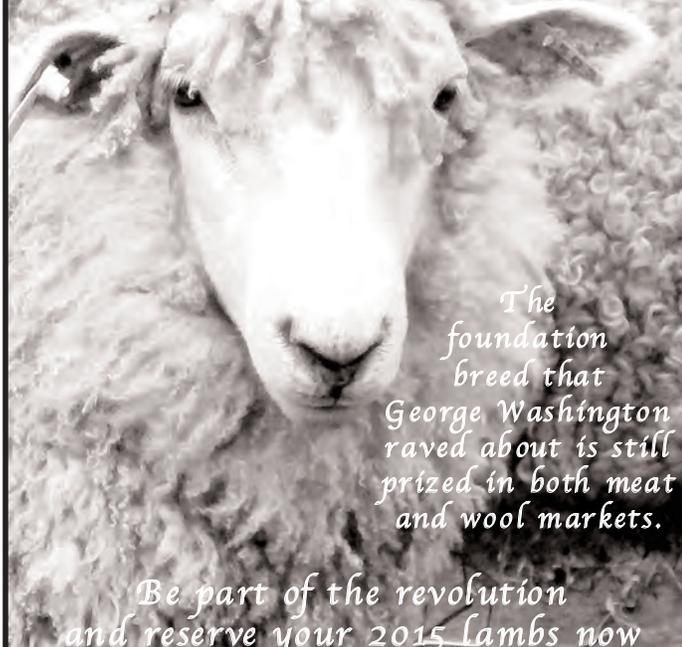


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DATED MATERIAL

CALENDAR

★★ denotes Livestock Conservancy event

★ denotes Conservancy participation

See the Conservancy website for a more extensive list of events. The Livestock Conservancy encourages event organizers to submit events related to conservation, farming, sustainability, rare breeds, and more to the Conservancy's Calendar. Send your submission to rwalker@livestockconservancy.org or mail to PO Box 477, Pittsboro, NC 27312.

October

October 1 – The Athens Area Fiber Faire will be held in Athens, OH. For more information, visit <http://athensareafiberfaire.blogspot.com>.

October 1-2 – The Vermont Sheep & Wool Festival will be held in Tunbridge, VT, with over 70 vendors offering fleece and yarn, fiber animals, handspinning and fiber crafting equipment, handcrafted items, and local meat and cheese. The festival includes contests, fiber arts classes and demonstrations, shepherd workshops, herding and shearing demos, a fleece sale, and more. Visit <http://vtsheepandwoolfest.com/>, email vtsheepandwoolfest@gmail.com, or call 802-592-3153 for more information.

October 1-3 – The Lambtown Festival will be held at Dixon May Fair Grounds, Dixon, CA. Sheep show with divisions for natural colored fine, medium, and long wool breeds. meet-the-breeds barn tours. wool show and sale, fiber arts vendors. sheepdog trials, and shearing contest. Information and entry forms are available at www.LambTown.org.

October 4-8 – The 50th Annual World

Dairy Expo will be held in Madison, WI. It serves as a forum for dairy producers, companies, organizations, and other dairy enthusiasts to come together to compete, and to exchange ideas, knowledge, technology, and commerce. Visit <http://worlddairyexpo.com> for more information.

October 9-12 – The 93rd American Rabbit Breeders Association (ARBA) Convention and Show & Fibber Cup Invitational will be held in Del Mar, CA. Visit <http://fibbercupinvitational.com/> for more information.

★ **October 22-23 – The Mother Earth News Fair** will be held in Topeka, KS. This sustainable lifestyle event features dozens of practical, hands-on demonstrations and workshops on everything from beekeeping to using solar electricity. Visit www.motherearthnews.com/fair for more information.

October 25-30 – The American Dairy Goat Association Annual Convention will be held in Austin, TX. Visit www.adga.org for more information.

November

★★ **November 3-5 – The Livestock Conservancy's National Conference**, "A United State of Agriculture," will be held at Hampshire College in Amherst, MA. Visit www.LivestockConservancy.org for more information.

November 4-6 – The Sustainable Agriculture Conference will be held in Durham, NC. Visit www.carolinafarmstewards.org/sac/ or call 919-542-2402 for more information.

November 10-13 – The Sustainable Poultry Network-USA National Conference will be held in Asheville, NC. Visit www.spnUSA.com for more information.

November 12-13 – The American Poultry Association's Annual Meet will be held in Columbus, OH. Visit www.ohionational.org or contact Eric Markley at markley@ohionational.org for more information.

December

★★ **December 31 – DEADLINE to update information and submit ads** for the Livestock Conservancy's *2017 Breeders and Products Directory*. If changes are needed, log in to update your information online or call 919-542-5704. For more information about advertising in the directory, email Ryan Walker at rwalker@LivestockConservancy.org or call 919-542-5704.

January 7-22 – The National Western Stock Show will be held in Denver, CO. This event features more than 15,000 head of horses, cattle, sheep, swine, goats, llamas, alpacas, bison, yak, poultry, and rabbits each year. Visit www.nationalwestern.com for more information.

January 12-13 – The Minnesota Organic Conference will be held in St. Cloud, MN. Visit www.mda.state.mn.us/moc or call Cassie at 651-201-6134 for more information.

January 13 - February 4 – The 121st Annual Fort Worth Stock Show & Rodeo will be held in Fort Worth, TX. The event features world-class livestock shows, kid-friendly exhibits, carnival/midway fun, live music, unique daily shopping, and nightly rodeos. Over one million visitors and 22,000 head of livestock participate each year. Visit www.fwssr.com for more information.