**2016 Northeast Pasture Consortium Annual Conference & Meeting Proceedings held at the Harraseeket Inn in Freeport, Maine, March 16-17**

# Agency Reports

After lunch, the **Research/Demonstration Directions and USDA Agency Reports Session** began. The first speaker was Cliff Hawbaker, Chairman, PA Grazing Lands Coalition, Chambersburg, PA. His presentation was *Ten Million and One Grazable Acres in the Northeast*. He had asked to address our Conference prior to the Conference to challenge us to come up with a way to market grass based meat and milk products and the other benefits that accrue with grass based agriculture. He began his talk with a explaining what "Ten Million and One Grazable Acres in the Northeast" is:

- Effort to document the extent of grasslands in the NE;
- Intent to promote grazing and grasslands;
- Project that can create partnerships of grazing groups and coalitions;
- Related directly to soil health, water quality, wildlife habitat and healthy communities.

He then said who would benefit:

- Soil & Water Conservation Districts
- State and National research projects
- State and National departments of agriculture
- Farm Education organizations
- Fish & wildlife agencies/groups
- Livestock organizations and farmers - dairy, beef, sheep, goat, swine, poultry, equine
- Seed and fertilizer companies
- Marketing of food products - local farmer and supermarkets
- Those who study Climate change
- Consumers - From Portland ME to Washington DC

He posed the question, "Why 10 Million and One?" He then answered with these points:

- Many of us promote and support grazing. We understand the importance of life in the soil, with livestock and humans working together for the good of the earth.
- If we don't have a goal or target, how will we know if we have arrived or made a difference.
- If we believe in what we do, then we need to measure our progress.

The world of life is our planet. A World that is sustainable is:

1. able to feed and support itself, and
2. able to reproduce itself.

We need to look at the big picture to see what can be accomplished with grass-based agriculture.

A) Soil Health – grasses and legumes promote increased microbial life and organic matter
   ~better water infiltration
   ~less erosion
   ~drought effects not as severe
B) Animal – well-managed pasture can have a positive effect on behavior and performance

~better health
~longer life
~improved reproduction
~lower carbon footprint per pound of meat and milk

C) Wildlife - pasture enhances a wide range of insect and animal species
D) Water - less flooding, more springs, cleaner streams and lakes
E) Air - cleaner air (less greenhouse gases) by carbon dioxide transferred to organic matter

"Changing the Climate" with grassland agriculture leads to a climate of better weather and economic conditions.

- Soil and Land
  - Building organic matter
  - Life in the soil
- Weather
  - Temperature moderated, Rain & snow retention
- Social and Economic
  - Support all forms of life to create a pleasant environment to live in.
  - Community - jobs and wealth building - rural villages renewed.

Can we get 10 million and one acres in the Northeast? Here is the distribution to reach the goal:

- PA 30% goal/3 million ac.
- NY 25% goal/2.5 million ac.
- New England 25% goal/2.5 million ac.
- MD, NJ, DE 20% goal/2 million ac.

(Editor's Note: Clifford inadvertently left out WV. The 2012 Census of Agriculture reports total pasture acreage in WV to be 1.6 million acres - includes woodland pasture and cropable pasture. This will make the job easier. NY currently is just under 1 million acres. PA is just under 1.1 million.)

Clifford then went through some calculations to show what 10 million acres would support. If 10,000,000 Acres, Then if 50,000 Managed wildlife acres and 9,950,000 Grazable acres? ~This will support 3,015,151 (1000 pound) Animal Units (@ 3.3 ac/AU) Number of livestock 10 million acres support are:

- 50% - 1,512,575 Dairy cows
- 20% - 603,030 Brood cow/calf
- 20% - 603,030 Finished beef
- 10% - 1,507,575 goats, sheep

Mr. Hawbaker gave the statistics for Northeastern states as he listed earlier (w/o WV). There are 162,257 square miles of land area (104 million acres). Landuse percentages as of 2007 Census of Agriculture are:

~60% Forest (62.4 M ac.),
~11% Urban (11.4 M ac.),
~12% Cropland and
~ 4% Pasture (16.6 M ac. combined)

He characterized the Northeast as the Nation's most economically developed, densely populated, and culturally diverse area. Food hubs and distribution networks for marketing of grass-fed products are being established. The number of small and mid-size farms are increasing rather than decreasing. Many farm operations are part-time as many of them are employed off-farm and work their farms after work and on weekends.

Potential criteria for 10 million and 1 acres* in the Northeast:

- Must have mixture of grasses/legumes/forbs with nearly 100% ground cover;
- Must have livestock grazing plan where a grazed period is followed by a rest period;
- Must have a plan to increase and monitor organic matter of the soil;
- Must have a measurement of microbial life in the soil;
- Acreage in pasture at least 3 – 4 years before cropping, then back to pasture.

*Acres in permanent hay, CREP, highway grass, wetlands, golf courses, private lawns, etc. do not count in 10 million and 1 acres.

Clifford then asked, "Where do we start?" Here are his thoughts on that:

- Develop an advisory team to oversee the project;
- Refine goals and criteria from above;
- Take inventory – how many acres do we know of now;
- Promote – Organizations working together;
- Outreach to grazing coalitions and groups.

For those interested in this project, Mr. Hawbaker referred them to these addresses to continue the dialog that he has initiated as he finished his presentation:

- Stay tuned at www.paglc.org
- Email for information at info.paglc@gmail.com
- Contact Cliff at hhdf@innernet.net

We then heard from the five research and outreach needs discussion groups. Each group had a spokesperson give a brief synopsis of research and outreach needs that were identified for each topic. Ms. Jennifer Colby was the first person to give a report. She represented the *Riparian Pasture Grazing Management to protect water quality & the landuse*. They had a list of eight needs:

1. Effectiveness of riparian buffers - There is still much to learn about stream-side buffers. Upland buffer effectiveness, where the upper edge can be placed on on a level grade to get a diffuse flow of water across the entire length of the buffer, is often used as a surrogate for practice effects. This is not possible along a stream buffer that follows the grade of a stream and is interrupted by small side ephemeral channels frequently along smaller order streams or sits on top of a natural levee along larger order streams (making it higher than the rest of the floodplain alongside of it). Denitrification of nitrates in the soil of the buffer requires a hydric soil of a certain quality that is not always present along every stream or every reach of a stream.
2. Identification of plant species that are most effective in trapping sediment, promoting denitrification, and removing and retaining P within the buffer, along with other beneficial attributes for fisheries and macroinvertebrates depending on stream order.
3. Riparian areas identified for their appropriateness for grazing, based on soil drainage characteristics, stream bank stability, grazing methods and duration used, and the season most appropriate for grazing livestock to be present, and the number of days livestock occupancy occurs yearly along a specific stream reach.
4. Resiliency of the riparian area needs to be measured or estimated based on soil drainage, plant

species present, stream bank stability, true wetlands presence, and any other factor that may impact on the site to recover from a grazing event or a series of grazing events over a year or more of use as pasture. This relates back to item 3 very directly.

5. A cross disciplinarian approach is needed with agronomists, hydrologists, geomorphologists, fishery and wildlife biologists, grazing lands specialists, water quality specialists, economists, and ecologists working with impacted farmers to devise a set of parameters with appropriate input data that provides a riparian area planning tool that creates a landuse plan that is reasonable for the riparian area in question.
6. An interface needs to be developed between policymakers and researchers involved in characterizing riparian areas and developing a riparian area planning tool. Policy has to be based on good science as much as the riparian area tool; otherwise, policy may trump reasoned tool outcomes if policy makers are not sold on a more comprehensive but flexible approach to managing riparian areas on private lands.
7. More work is required to find the right set of performance metrics to measure and monitor the effects riparian pasture conservation practices have over time towards achieving key goals of protecting water quality while providing forage to livestock and improving farm economic viability.

The next report came from Gordon Jones on *Orchardgrass Die-Off Investigation Action Plan adjustments*. Continued research is needed in the area of orchardgrass (OG) persistence to assist producers, especially in the southern states of the Northeastern region, to improve the longevity of their OG haystands. The current research being conducted on OG persistence at Virginia Tech will likely conclude after the 2016 growing season. Further research is needed to answer several questions about the problem and managing OG persistence.

1. Are certain varieties of OG more tolerant to low cutting heights and heat and moisture stress? A longer ( > 3 year) genotype × harvest management × environment experiment may be required.
2. How does heading date of OG varieties influence summer regrowth and persistence?
3. How does fall, winter, and spring management (harvest and fertilization) impact the number and quality of vegetative tillers present in stands in mid-summer?
4. For producers concerned with the risk associated with establishing new OG stands, what alternative grass species are recommended that are more heat tolerant with similar characteristics in forage quality, yield, and ease of establishment as OG?
5. Given crop growth models and climate change predictions, how would we expect the ranges of OG and other cool-season grasses to change in the future? Which forage species might become better adapted?

Participants in the OG research needs session were: Jim Cropper, Tim Fritz, Gordon Jones, Howard Skinner, and Don Wild.

Alice Begin gave the next report representing the *New Forage Varieties to enhance and extend pasture productivity*. Here is the list that this group put together:

1. Birdsfoot trefoil (BFT) requires more research trials to delve into getting more disease tolerance to Fusarium wilt (caused by Fusarium oxysporum f. sp. loti) in the Northeast. Boosting BFT

condensed tannins content to lower rumen degradable protein and have more of its protein degraded in the intestinal tract of ruminants would be beneficial to boost milk production in dairy cows without reducing BFT palatablility. Seedling vigor has also been an issue with BFT making farmers shun it due to its unpredictability in creating an adequate stand. Some newer varieties are showing better seedling vigor, but it is not clear whether or not this is what can be ultimately achieved to make BFT as easy to establish as alfalfa or the commonly planted clovers. Currently, it cannot compete well with other forages planted at the same time with it.

2. Birdsfoot trefoil seed availability for some varieties is limited. It was grown in the New York until the Fusarium wilt problem made it impossible to retain seed production fields.
3. Demand for BFT is low due to its reputation of having poor seedling vigor and short life if establishment goes well. These poor attributes trump its good attributes.
4. Forage breeders and forage agronomists should collaborate with Cornell University Forage Breeding Project. They were the first to develop a Fusarium wilt resistant variety, Pardee.
5. Improved varieties of several cool-season grasses species are still needed - improved heat resistance as climate change ramps up, improved disease resistance, winter-hardy ryegrasses (better but still not entirely reliable), improved drought resistance, and improved digestibility.
6. Evaluate forage species and their varieties for their performance in trials growing on sub-optimal soil fertility and pH soils.
7. Forage trials comparing seeding mixtures by variety to see if there is any varietal differences within a species that fair better than other varieties within species when planted in a mixture.
8. Improved varieties that are grazing appropriate. Examples are: Prostrate orchardgrass varieties versus upright hay type orchardgrass varieties, birdsfoot trefoil also has prostrate varieties for grazing as well as upright hay types, and Alfagraze™ is a notable alfalfa that was rigorously selected to be grazing tolerant.
9. Methodology to arrive at relative grass maturity that provides consistency. Much work has been done on some grass species such as orchardgrass and timothy to either delay maturity or advance it to match better with alfalfa maturity at harvest when grown with alfalfa. The grasses do not persist well unless they are at the proper maturity too when harvested with alfalfa. As a result, it is hard to compare species differences in maturity as some species have a number of varieties with different maturity dates for the locale they are grown in. In the case of orchardgrass as a pasture grass, later maturing is better so that the rotational grazing of it can complete the Spring cycle without seedheads forming before the last paddock in the schedule is grazed, or at least delayed as long as possible. This avoids having several acres of ungrazed orchardgrass to harvest as hay/haylage or several paddocks where the headed-out orchardgrass is avoided by grazers and the forage must be clipped to get rid of the unwanted vegetation.
10. Study mycorrhizal fungi association with grass and forb roots under varying soil pH and phosphorus status. "Mycorrhizae are particularly important in assisting the host plant with the uptake of phosphorus and nitrogen. Mycorrhizae actually increase the surface area associated with the plant root, which allows the plant to reach nutrients and water that might not be available otherwise. That makes the plant stronger, especially during drought periods. Stronger individuals means that the plant community is more resilient to disturbance. Some mycorrhizae may even protect their host plant against unwanted pathogens (From BLM website)."
11. Forage trials that look at flowering species that attract pollinators. Legumes should fit the bill here as they are dependent on pollinators for pollination to occur well to form seeds.

Ms. Sarah Flack was next up. She presented the research and demonstration needs for *Transitioning dairy cows to a no grain or high forage diet* discussion group. Current work and future needs were:
Current:

1. Dr. Sabrina Greenwood is doing a study on 20 grass fed dairies presently.
2. SARE grant proposal by Dr. Heather Darby of UVM and Sarah Flack to study transitioning dairy cows best management practices.

Future work:

1. Additional energy to cows on a high forage diet - When and how much energy? Best supplement to meet energy demand to enhance milk flow and still be economically fed?
2. Research more balanced on achieving total volume of milk and high milk solids content of milk (Editor's note: On this particular point it seems that some farmers using a high forage diet during the pasture season to feed their cows see their milk components go higher. Yet, looking Dr. Sabrina Greenwood's table 5 on page 56, Comparative Numbers in Milk Production, the TMR fed cows actually had more solids in their milk than the medium quality and high quality pasture fed cows. This study runs counter to the hoped-for or observed result of feeding a high forage diet of pasture. There is also a very high spread between ME allowable milk and MP allowable milk for the pastured cows in that table so those cows have to excrete a lot of N since energy is limiting milk production and the excess protein has to be eliminated from their body which is neither good for them (BCS) or possibly the environment (ammonia volatilization, and N leaching underneath urine spots, perhaps even grass burn, methane generation higher?).
3. Explore the cumulative impact of having the wrong genetics to effectively go to a high forage diet.

Dr. Diane Van Hekken was the last spokesperson for a concurrent discussion group giving us their report on *Pasture-fed Ruminant Fatty Acid Profiles - What is their Value? Where do we go from here to validate their value to human health?* She broke down her presentation into current, interests, future, funding sources, and a summary.

Current:
No one in our group (16 participants from private and public sectors) could identify research currently being conducted on FA profiles in beef.
There are three programs currently collecting FA profiles in milk.

1. Univ. New Hampshire (Brito) is in the last year of his National Organic Program funded research project that investigates the utilization of flax seed in dairy cow rations. Part of the analysis is to track FA profiles in milk.
2. ARS, Dairy & Functional Foods Research Unit (Tomasula/Van Hekken) is continuing to investigate the health-value of milk, impact of non-thermal processing of milk on the bioactive compounds in high moisture cheese, fate of FAs and other food components in human digestion (new artificial gut system to mimic human gastro-intestinal tract), and improving sustainability by modeling dairy processing to lower environmental impact.
3. Organic Valley (Miller) is continuing to build their FA data base, now in 5th year. FA profiles are collected every 2 months from grass-fed cows and used to help counsel dairy producers to

maintain high levels of healthy fats in their milk.

Interests:

1. Although healthy fats (omega-3 FAs and CLAs) are important, other components may also play a role in human health and no or little information is currently available depending on the component of interest.
2. Ruminants have major roles in the environment and the human food chain. Research needs to target the role the whole system has on human health (not just one or two compounds in isolated systems), determine the balance between factors, and obtain a better understanding of the complexity of the system.
3. There is definite consumer confusion of health claims and miscommunication of scientific findings to support biased views. Concerns on how to get information to consumers that will help them make informed decisions, especially for grass-fed beef.
4. Research needs to continue to focus on ways to enhance the level of 'naturally occurring' health beneficial compounds in foods instead of turning to 'additives'; i.e. adding fish oils to dairy products to boost omega-3 FA levels.

Future:
There is a willingness among participants to collaborate to address research needs.

1. Emphasis is on determining healthy fats in grass-fed beef, the impact of cooking on the fat profiles in beef, and establishing which cooking methods would best retain the healthy fats available to the consumer. Dr. Rayburn is willing to go through his compositional data base on raw beef and develop a fact sheet that could be made available to consumers. Dr. Fukugawa, ARS Human Nutrition Director, will help facilitate getting collaborators from her research labs. [Since the meeting, Dr. Donna Coffin, University of Maine, has started inquires to potential collaborators to look at FAs in raw and cooked beef.]
2. Dr. Brito is interested in developing another proposal to expand/bridge his current research.

Funding:
National Organic Program, NIFA programs, Foundation grants

Summary:
Major research is needed in determining the health-value of grass-fed beef, especially cooking of cuts and ground beef. Develop a multi-disciplinary and location project that addresses farm-to-fork health-value of beef, including different cooking methods, and create a fact sheet for consumers. We ask NEPC to continue to write support letters for proposals addressing NEPC goals.

### 2016 Northeast Pasture Consortium Stakeholder Pasture Priority needs

The following priority needs are in order of priority. Any research project undertaken will include a cost analysis of implementation for farmers.

1. Explore new alternatives i.e.. YouTube videos, for transfer of knowledge and information to increase adoption of research findings within the agriculture community* such as farmer mentoring, case studies, and creative use of technology in promotional materials. Produce summaries that are accessible to Extension Education, non-profits, and health professionals. Moved from 11.

   *Getting information to producers is a top challenge.

2. Exploring and explaining the impacts of stream and streambank exclusion from livestock grazing riparian areas. This priority is an immediate need and is based on problems in the Chesapeake Bay Watershed, especially in Maryland. State regulations are out due to EPA's guidelines based on Total Maximum Daily Load (TMDL) that call for livestock exclusion from streams and other water bodies that lie within pastureland to reduce nitrogen, phosphorus, and sediment loads entering Bay waters. There is not a clear scientific-based answer as to the impacts of careful grazing management have on streambanks and water quality. Therefore, the regulations are not based on science but on perception. Further research is needed to support and extend existing research which at this point is not very extensive and sometimes lacking in methodology and execution. Some studies refer to some small streamside exercise lots (livestock primarily fed stored feed) as pastures just because some grass struggles to grow on them. Stock densities on them are clearly above what is sustainable pasture carrying capacity. Current and past research is being compiled in a literature review on the impacts of grazing riparian areas appropriate for eastern US pastures at University Park, PA.

3. Research problems with orchardgrass persistence. Persistence has become a problem in hayfields throughout the Mid-Atlantic with some stands lasting only one or two years before dying out. This is disconcerting enough, but if it extends to pasturelands, we will be losing a major, highly productive forage species for grazing as well. Several factors have been identified as possible causes for the loss of orchardgrass, but it is still inconclusive what the underlying cause is.

4. More focus is needed on parasite issues for pastured small ruminants, especially given climate change and possibly a longer, warmer grazing season. Since synthetic dewormers quickly lose their effectiveness due to overuse, we are interested in seeking out botanical dewormers, such as birdsfoot trefoil, with condensed tannins that are natural dewormers that can be grown in pastures. We are also interested in selecting and breeding small ruminants that have a natural resistance to intestinal worms (work underway at WVU).

5. Research in meat and dairy products has found that omega-3 fatty acids (FA's) are higher in these products when they come from pastured livestock, while omega-6 FA's are lowered. The ratio of omega-6 to omega-3, therefore, is lowered significantly and is considered by the medical community to be more healthful to the consumer. In the Northeast, livestock have to be overwintered on stored forages which do not confer the same fatty acid synthesis. In addition, Are there levels of grain supplementation that would still achieve an increase in omega-3 FA and conjugated linoleic acids (CLA's)? Currently, research is underway at UNH and ARS at

University Park, PA, to overcome this problem with feeding small amounts of flaxseed to dairy cows in their winter feed ration. This looks promising. The Dairy and Functional Foods Research Unit at Wyndmoor, PA is studying FA composition in grass-fed cow's milk and seeing how it and biologically active compounds are affected by different milk processing techniques so as preserve these health-promoting components found in raw milk in processed milk.

6. Determine the environmental impacts and profitability of alternative supplemental feeding strategies for animals on high quality pastures. What is the effect of stock density as it pertains to soil health and animal health? How do you manage energy in a high quality pasture? Are there alternatives to feeding supplements?

7. Evaluate and promote annual forage species, improved varieties, and new species combinations under grazing management and changing climatic and soil conditions with emphasis on extending the grazing season (mid-summer slump and both ends of the growing season).

8. How to improve grazing lands with low inputs (especially land with C+ slopes) and using silvopasture techniques on understocked (w/trees) hardwood forests. This is a primary concern, especially given losing moderate quality land to corn production and pushing even more marginal land into production for grazing

9. Quantify the economics of whole-farm systems including the effects of breed selection, livestock diversification, and grazing management on animals and pasture health to promote safe, healthy, and secure local community food systems.

10. Determine the management strategies and costs of transition or conversion from row crops, forest, and idle ground to productive and sustainable grazing lands and soils. How do you start the soil biological community when transitioning from row crop, forests, and idle ground to grazing lands? Research old findings, disseminate and re-evaluate.

11. Identify environmentally sound marketing opportunities in dairy and livestock pasture-based production systems (grass-fed products). Produce summaries that are accessible to Extension Education, non-profits, and health professionals.

We then went to the USDA agency reports. Natural Resources Conservation Service did not have anyone available to give a national view on pasture related issues this year due to travel restrictions and a planning session for a Greenhouse Gas Emissions meeting that was to be held the following week at the National Agricultural Library that even prevented presenting the report remotely by Sid Brantly.

Dr. Peter Kleinman from the Pasture Systems and Watershed Management Research Unit at University Park, PA gave the USDA-Agricultural Research Service (ARS) report. With the disproportionate hit on pasture research facilities in ARS (lost research units in Florida, Ohio, and West Virginia), ARS research are initiatives that focus on national and regional issues of importance. It is left to the land grant universities to do research on local issues.

A goal set for ARS by 2025 is to launch the Agency-wide "Grand Challenge" which aims to "Transform agriculture to deliver a 20% increase in quality production at 20% lower environmental impact by 2025."

Riparian grazing management is taking a backseat to policies that use a band-aid approach to watershed management. It is hoped that the riparian area planning tool being developed at the Pasture Systems and Watershed Management Research Unit will be adopted by land use and regulatory agencies when it is finished. It allows flexibility in riparian area management. Different riparian areas require a different set of conservation practices to allow the farmer to use his pastureland to feed and house livestock in such a way as to protect water quality and stream integrity.

The next speaker was Jim Dobrowolski representing the National Institute of Food and Agriculture (NIFA). He gave his presentation from Washington DC over the speaker system by telephone with Jim Cropper advancing PowerPoint slides. We had planned to use Skype, but ran into technical difficulties with it and fell back to an old method of presenting the information. The title of his presentation was *Funding Opportunities for Rangeland and Grassland Ecosystem Research, Education and Extension - Connecting People and Science.* He started his presentation by saying what the Mission of NIFA is. "Invest in and advance agricultural research, education, and extension to solve societal challenges." Strategically they strive to:

- Catalyze exemplary and relevant research, education and extension programs.
- Transform NIFA into a model agency with a highly motivated workforce.
- Institutionalize streamlined, effective technologies, policies, and processes.
- Advance America's global preeminence in food and agricultural sciences.

Examples of their program areas are:

- Family and youth development (including 4-H)
- Human nutrition
- Community development
- Food processing and safety
- Natural resources and environment
- Plant systems
- Animal production, health, and disease
- New markets and products
- International programs

Federal assistance through NIFA is composed of:

- Capacity programs
- Competitive grants
- Targeted programs
- Agreements with other Federal agencies

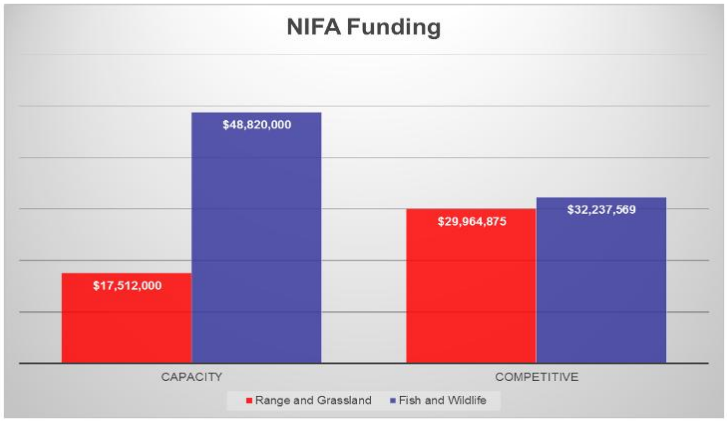
Dr. Dobrowolski compared some USDA agencies in size and budgets with NIFA. They are a small agency, but being they are a grant funding agency that have a very sizable budget. The comparions are

shown in the chart below.

| | NIFA | ERS | NASS | ARS |
|---|---|---|---|---|
| 2016 Staff-years | 350 | 300+ | 1,188 | 8,000 |
| 2017 Staff-years | 350 | 300+ | 1,358 | 8,000 |
| 2016 Appropriation | $1.338 Billion | $85 Million | $168 Million | $1.143 Billion |
| 2017 Budget | $1.884 Billion | $91 Million | $177 Million | $1.256 Billion |
| | | | | |

Dr. Dobrowolski then focused his presentation to our interests by talking about the National Programming in Rangeland and Grassland Ecosystems of which the pasture landuse is a part. Jim is the National Program Leader for Water, Rangeland and Grassland Ecosystems. National Progam Leaders manage Hatch Capacity Projects, Renewable Resources Extension Act Projects, and manage and coordinate among competitive programs.

NIFA Capacity/Competitive Funding
Summary FY 2009-2015




He displayed a summary of the money spent on range and grassland versus fish and wildlife by NIFA for fiscal years 2009 to 2015. Several millions of dollars go to range and grassland projects, but we seem not to get much from the capacity budget. NIFA provides capacity grant support for research and extension activities at land-grant institutions through grants to the states on the basis of statutory formulas. The Hatch Act of 1887 and the Smith-Lever Capacity Grant Act are examples of capacity grants. The Hatch Act is for agricultural experiment station research and the Smith-Lever Act is for agricultural extension activities by land grant universities.

The competitive grant program of main interest to the Northeast Pasture Consortium is the Agriculture

and Food Research Initiative (AFRI) that provides funding for fundamental and applied research, education, and extension to address key problems of national, regional, and multi-state importance in sustaining all components of food and agriculture. Other programs that we have been involved with are:

- The Integrated Organic Program (IOP) is a competitive program that has included the Organic Transitions Program (ORG) since 2001 and the Organic Agriculture Research and Extension Initiative (OREI) since 2009.
- The Sustainable Agriculture Program (SARE) supports agricultural science that fosters continuous improvement and a balanced approach to progress among the four pillars of sustainable agriculture which are productivity, environmental quality, profitability, and quality of life. Competitive grants are administered regionally, such as NESARE.

Jim gave an example of an AFRI Foundational—Bioenergy, Natural Resources and Environment (BENRE) project funded in FY 2016, "Brush management and ecosystem services: a quantification of trade-offs on western rangelands" to objectively quantify and assess trade-offs between woody plant encroachment and brush management so that policymakers and land managers can better differentiate among the consequences and cost-benefit of competing land use and management.

Other competitive grants approved were:

- Cattle grazing strategies to sustain and enhance sage-grouse habitat—Montana State University

This projects seeks to facilitate the coexistence of cattle grazing and sage-grouse on western US rangelands.

- Evaluating the influence of climate change on the commingling of livestock and wild ungulates: Quantifying the risks across Wyoming rangelands—University of Wyoming

The goal of the proposed work is to develop a framework for understanding the ecology of wildlife-livestock commingling, with particular focus on how climate change will influence the distribution of wild ungulates and livestock on shared rangeland.

- Enteric methane emissions measurement system for grazing beef and dairy cattle:

To conduct production systems-based evaluations of beef and airy sustainability (e.g. comparing different grazing methods and forages farmers and ranchers can practically adopt)—Agricultural Research Service

- Adaptive grazing management to sustain multiple ecosystem services in rangeland ecosystems:

The research team supported by this grant will measure the effect of adaptive grazing management on plant diversity, variability in vegetation height, and the reproductive performance of native grassland birds species.

This last competitive grant approved could be something for the Northeast Pasture Consortium to pursue by writing a grant proposal for sustaining multiple ecosystems services on riparian area pastures in the Northeast.

Jim then gave us examples of currently active Hatch Act capacity funded grants:

- Texas A&M University - Promoting resilience-based management for rangeland ecosystems.
- New Mexico State University - Alternative management approaches to enhance animal

adaptability and improve sustainability of rangeland livestock production.
- University of California - Understanding and managing responses of California forests and rangelands to drought and fire.

SARE grant opportunities with funding at $20 million have three primary proposal areas. They are Farmer/Rancher where innovative management techniques are tested and shared, Professional Development where train the trainer programs are promoted, and Research and Education where new research is put in a form that is easily understood and widely disseminated.

As an aside, Jim mentioned that the 4-H program nation-wide incorporates rangelands and grasslands in their initiatives. Two examples were shared with us:
- The National Headquarters of 4-H is working with several federal agencies on the Pollinator Health Initiative—launching a big program on Monarch butterflies—includes rangeland and grasslands (New England pastures in our farmer survey results commonly had milkweed in them - essential for Monarch butterflies);
- Ongoing Wildlife Habitat Education Program (also on range and agricultural lands)—with extension educators across the country.

Dr. Dobrowolski ended his presentation thanking the Consortium for giving him the opportunity to speak at our Conference.