

DAKOTA TERRITORY BUFFALO ASSOCIATION

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June 3 Stockmanship Seminar

Everyone's invited! Please make plans to join the 777 Ranch and Dakota Territory Buffalo Association as we host a one-day Stockmanship Seminar on Friday, June 3. The seminar will be conducted by Tina Williams and Richard McConnell (see their website at www.handnhandlivestocksolutions.com). This one day seminar will cover the value of stockmanship and gives you many good stockmanship tools to take home.

Some of the topics that will be covered during the day-long seminar include: What is the value of stockmanship? What are the advantages to the handler and to the livestock? Using the natural instincts of livestock; Predator/prey relationship; Your positioning; Pressure and release; Movement-good and bad; Where and how to begin training the herd; At the gate; Sorting livestock; Working in the corral; Loading livestock; Receiving new animals; Weaning and our attitude as we deal with our livestock.

This is a great opportunity to come and learn more about low stress livestock handling and the many benefits that come with it. Tina is the daughter of Bud Williams, who is very well known for his stockmanship and low stress handling ideas and techniques.

The seminar will run from 8:00 a.m. to 5:00 p.m. on Friday and lunch is included for all attendees. There is no fee to attend, as the seminar is being sponsored through the generosity of the 777 Ranch! On Saturday, there is an optional half-day Stock Handling Seminar that will be presented for anyone interested.

The seminar will be held at the 777 Ranch, which is located east of Highway 79 near Fairburn, SD, approximately 8 miles south of Hermosa. As you are heading down the highway, watch for the 777 Ranch sign on the east side of the road.

If you are from out of the area and need assistance finding a place to stay, feel free to contact the DTBA office at 605-923-6383 or info@dakotabuffalo.com and we'll be glad to help you find nearby accommodations. The 777 Ranch is about 30 minutes south of Rapid City.

To guarantee your spot in the seminar, please RSVP to Mimi Hillenbrand, PO Box 8303, Rapid City, SD 57709-8303 or email her at: ramicus@aol.com.

Anthrax A Threat This Spring

South Dakota's State Veterinarian, Dr. Dustin Oedekoven, reminds livestock producers to remain diligent in vaccinating their livestock against Anthrax.

Flooding in various parts of the state, as well as around the country, has created conditions that are favorable for Anthrax.

Anthrax spores may lie dormant in soil for years, only to surface after flooding. The most effective way to manage the disease is through annual preventive vaccination, as unvaccinated animals tend to die suddenly after exposure, with no opportunity for treatment.

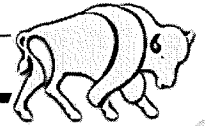
Your local veterinarian is a valuable source of information regarding vaccination protocols.

DTBA Gun Raffle Winner

Congratulations to Keith Yearout of Lake City, Kansas, whose name was drawn as the winner of the artist's proof Sharp's Buffalo Rifle raffle. Keith purchased one ticket at the National Bison Association conference in Denver this past January and it was the lucky ticket!

A total of 330 tickets were sold on the rifle, generating a very nice fundraiser for the association. Many, many thanks to those of you who purchased tickets on the rifle or took a pack or two to sell to family, friends and associates. Without the efforts and generosity of each one of you, we could not have successful fundraisers like this one. A huge final push during our conference weekend gave a huge boost to the raffle. Way to go!



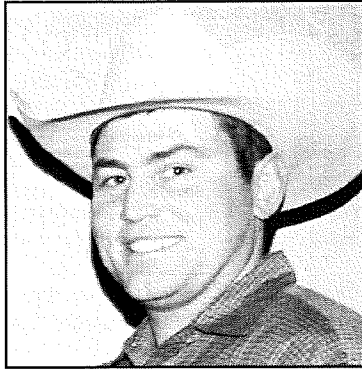


Notes From The President - John Cammack

First off, I would like to thank all of you for giving me this opportunity to be on the board of directors. This is an honor and a privilege and I hope to do as good of a job as the past presidents have done for this great association. Next, I would like to thank past President, Bruce Anderson, for all his hard work and dedication to the DTBA. He has been, and will continue to be, a great asset to the association.

Congratulations to our newest board member Marielle Graese. She is a young, energetic and all around great person to work with and I can't wait to see what she will do for the DTBA. The other person that ran for the board was Travis Mickelson. I thank him for that and hope he will run again in the future. Chad Kremer was term limited out this year and I want to thank him for all his hard work, it was a privilege to have worked with you on the board and get to know you over the years. Your willingness to do what ever it takes to better the DTBA and the buffalo industry is one of a kind and I thank you for your service.

Earlier this year, as it was snowing and blowing outside with wind chills way below zero and a nice 12-16 inches of new snow, I figured it would be a great time for the Cammack Ranch to start calving their beef heifers and for me to stay up at night and check them. It makes for a lot of time to think of ways to get rid of them and have more buffalo. If you have only owned buffalo in your life stick with it! There is no greater animal in the world to raise. The last time we worked our beef cows, I was in the back pushing them up - sometimes literally pushing them up. I was getting so mad and frustrated and then I got to thinking about working the buffalo and how easy they just flow through things. There are lots of people out there raising cattle and it's all they have ever done and don't know any better. It made me laugh as I realized that I could still be one of those guys that haven't had the privilege of owning buffalo. So, on I went pushing cows, dreaming of



the day where only buffalo will be going through the facilities at the Cammack Ranch. What will I do with all my free time? I guess I'll get to hunt, fish and watch the buffalo roam.

To those of you that missed the winter conference you missed a good one. The amount of audience participation that went on was great. It's always wonderful to see so many people in one place, all wanting to see our industry go forward and not forgetting about the mistakes we made in the past, but using them as a tool for the future. One thing that the buffalo industry has over other agricultural industries is the fact that we are so willing to share our successes and our mistakes with each other so others won't make the same ones. There is so much work put into the winter conference. From setting up the agenda to arranging a place to hold the event, the one person that works harder than all of the rest of us combined would be Karen. Thank you so much for all that you do for us and I don't say this lightly we couldn't do this without you. The show and sale was great. Thank you to all the buyers and consignors. A big thanks-a-million goes out to Zane Holcomb and Chad Kremer for all the hard work you guys put into this event.

With meat prices at an all time high and lots of room to grow, there is no better time to be in the buffalo business. If you are not in this industry, what are you waiting for? Where we GROW from here is up to you. I encourage all of you to be involved as much as you possibly can in this association and the buffalo industry. If we all just sit back and do nothing, we will have nothing, but if we all work hard at what we love it will flourish.

One thing I want to do as the president is to put my information in front of you so you can get in touch with me with your ideas and concerns. I am ready and willing to do what it takes to continue to make this association better. My phone number is (605) 985-5289 and my email is bowhunter4life@goldenwest.net so please use it. I can't wait to hear all of your great ideas.

Calendar Of Buffalo Meetings, Workshops, Auctions and More!

June 3: 777 Ranch and DTBA present a Stockmanship Seminar with Tina Williams and Richard McConnell. Held at the 777 Ranch, Fairburn, SD. ramicus@aol.com.

June 8: National Buffalo Foundation 18th Annual Fundraiser. Jamestown Civic Center, Jamestown, ND. (701) 252-8648.

June 16 - 18: National Bison Assn. Summer Conference. Big Sky, MT. (303) 292-2833 or www.bisoncentral.com.

July 7 - 10: White Cloud's 15th Birthday Celebration and Tatanka Festival. Jamestown, ND. (701) 252-8648.

Sept. 24 - 26: Custer State Park Arts Festival and Buffalo Roundup. Custer State Park, SD. Call (605) 255-4515, or www.custerstatepark.com.

November 19: Custer State Park Fall Classic Live Public Auction. Call (605) 255-4515, or www.custerstatepark.com.

November 26: Minnesota Buffalo Assn. 15th Annual Legends of the Fall Show and Sale, Albany, MN. Visit www.mnbison.org

Checkoff Challenge Donation

The Black Hills Buffalo Classic and Premium Auctions ask both our buyers and consignors to donate \$1 per head of buffalo purchased and sold to the National Bison Association's Checkoff Fund. With nearly 100% participation, this year's Checkoff Challenge raised \$241. DTBA matches the amount dollar for dollar and sent a check for \$482 to the National Bison Association. Thank you to all our buyers and consignors for your support of the DTBA Checkoff Challenge!

or (507) 454-2828.

December 9 - 10: North Dakota Buffalo Assn. Annual Meeting and Fall Consignment Sale. Seven Seas Hotel and KIST Livestock, Mandan, ND. NDBA office at (701) 252-1122.

January 19 - 21, 2012: The National Bison Assn. Winter Conference and Gold Trophy Show and Sale, Renaissance Hotel and NWSS Auction Arena, Denver, CO. For more information, (303) 292-2833 or www.bisoncentral.com.

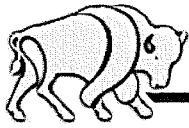
February 3 - 4: Dakota Territory Buffalo Assn. Winter Conference, Ramkota Hotel, Rapid City, SD. (605) 923-6383 or www.dakotabuffalo.com.

February 5: DTBA's Black Hills Buffalo Classic Show and Sale and Premium Sale. Jim Kjerstad Events Center, Rapid City, SD. (605) 923-6383 or www.dakotabuffalo.com.

July 24 - 27: International Bison Conference 2012. Quebec City, Quebec, Canada. www.bison2012.com.

2011 Membership Dues Final Notice!

Check on the front mailing label of this newsletter. The year your dues have been paid through is highlighted on the mailing label. If it says "2010", you need to renew your dues at this time. Invoices are included in this newsletter but just in case we missed you, please check your label and get your dues paid up so you will continue to receive materials and information. Thank you to everyone who has already sent in your 2011 dues.



Ride Your Motorcycle To Big Sky

The motorcycle ride to Big Sky will start in Rapid City, SD on Tuesday, June 14, 2011 beginning at 8:30 a.m. We will be leaving from Black Hills Harley Davidson (I-90, Exit 55) and the ride will go by Devil's Tower en route to lunch at LuLu Belles in Gillette, WY.

From Gillette, we will continue to Greybull, WY, where a block of rooms have been reserved at the Yellowstone Motel. The rates are reasonable and there are all the amenities one might need close by. Call Sharon at (307) 765-4456 and tell her you are with the NBA motorcycle tour to reserve your room. This ride is approximately 350 miles on the short route and 450 miles on the longer route. Riders can choose which route they would like to ride. The days are long this time of year so all can travel at a comfortable pace.

We will leave Greybull on Wednesday morning for a short one hour ride to the Irma Hotel in Cody, WY for breakfast. From Cody, we will travel the Chief Joseph Highway to Cooke City, MT, across the north side of Yellowstone Park and then travel up Paradise Valley to Livingston, MT. We'll continue across the Rockies to Belgrade, MT and down the Gallatin Valley into Big Sky. This is a 340 mile ride. The scenery on this entire ride is varied and beautiful. Come and enjoy the camaraderie with your fellow bison enthusiasts.

For additional information, the ride coordinator is Jud Seaman. Call (605) 390-1419 with your questions or suggestions.

Welcome New & Returning Members!

Walter Brettschneider, Spirit of the Tatanka Ska Ranch
Hermosa, SD

Chad Bullinger, Golden Bison Co., dba High Plains Bison
Denver, CO

Veronica Gerard, Kennebec, SD

Dusty Hepper, Turner Enterprises, Gordon, NE

Rollie Hill, Broken Heart Buffalo Ranch, Rapid City, SD

Mac Hull, I.H.S., LLC, Columbus, NE

Will Isham, Gordon, NE

Mark Tilsen, Native American Natural Foods, LLC, Kyle, SD

Evie Woodall, Big Sky Ranch, Deering, ND

Western Bison Association, Mead, WA

Kevin Casey, Riata, LLC, Rapid City, SD

Doug Candee, Candee Ranch/Antelope Creek, Gladstone, ND
E.L. "Gene" & Diann Deyo, Rapid City, SD

NBA Summer Conference in Big Sky

From The National Bison Association

The National Bison Association is pleased to announce the 2011 Summer Conference is being hosted by the Montana Bison Association and promises a variety of activities that are sure to please the entire family. Not to mention the beautiful scenery. The conference will be based at Big Sky resort in Montana, just outside of Yellowstone National Park, about 45 minutes south of Bozeman, where the closest airport is located.

The NBA already has over 170 registered bison enthusiasts for the get together, the best attended summer conference in recent history!

As you'll see on the agenda, we have something for everyone! From our keynote speaker, Bruce Vincent - a motivational speaker focused on rural American life, to an update on today's bison industry from the major marketers, to a discussion on bison genetics, we're covering a lot of ground in three days.

There will be plenty to keep you busy, including an optional tour of Yellowstone National Park on Thursday with presentations from the park's bison specialists. The Thursday tour, which costs \$65/person and includes transportation and admission to the park, will conclude with a gourmet bison feast at the classic Montana lodge, Buck's T-4. The dinner is also included in the Thursday ticket price.

Friday's agenda includes the bi-annual NBA membership meeting, and a wide array of presentations from bison experts that promises to be both inspiring and educational. Friday will conclude with a banquet dinner under Lone Mountain and a fun auction.

And for the littlest bison enthusiasts, Big Sky resort has a kids' club that is filled with activities to keep your little ones busy all day. Sign them up upon arrival and visit <http://www.bigskysort.com> for details.

The "ranch day" for this year's Summer Conference is a particularly good opportunity with a tour of Ted Turner's Flying D Ranch, just down the road from Big Sky resort. This ranch property includes Turner Enterprise's prized bison in an incredible setting attendees will get to see up close and personal. The ranch day will include tours of the ranch, a bison barbeque and presentations from the Turner team.

More information and registration for the NBA Summer Conference in Big Sky is available on the National Bison Association website at www.bisoncentral.com.



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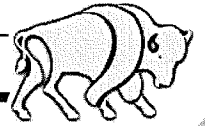
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Show and Sale Chairman Reflects on 2011 Black Hills Buffalo Classic



By Zane "Grizz" Holcomb

The DTBA survived its 15th year! From arguing over the name to upholding the reputation, it has all come home. We had a very good sale. I saw some shining stars, I saw some premium calves I wish had been entered in the show and I saw many I wish went home in MY trailer (some did, way to go Uncle Bob!). There is a consistency at the Black Hills Buffalo

Classic due to our consignors. The quality was again bar none. All of that lay in their laps. Absolutely top notch buffalo. Personally, I can't thank all of you enough.

Scott and Susan Peterson and Joe Dickman, Jumpoff Buffalo Ranch, flat hit one over the fence, one swing. Over the Big Green Monster. 16 Young Guns bailed out and what group! Everything is on a learning curve and this class just keeps getting stronger. Scott and JD, you both are going to have to pull one out of nowhere to improve! The bulls truly shined. High five!

The weather gave us challenges we weren't planning on, but we are now! Who would've thought we'd have warm temps? One challenge that was cut in half is due to Chad Kremer and crew who set up the pens. Between the "Chaderized" set up, the judging pen and the gate screens, things went smooth as silk. And we see what to change next year. Progressive thinking made this year flow. Many thanks Chad and crew, that was great! Can we do a high ten? I can make seven...

Hats off to Boyd Meyer from Cold Creek Buffalo Company. Boyd's Young Guns bull garnered the top honors and the biggest check. That was one strong bull! Jim and Veronica? Nice showing! I have yet to have repeat recipients of my trophy sponsorship.

I proudly shook Jim's hand - three years I sponsored, three years no repeats. The DTBA truly gets things spread out. Love it.

I can never give all those involved due credit. The day I think I became intelligent is the day I realized how much I do not know. There are many souls involved in this production, mine being a small part. And the simplest. The DTBA has solid people, the kind you want to hang with.

Now I get to raise a flag, my future prediction for Hall of Fame? Ron and Jud. They may be the first duo, but never more deserved. These two have stood by all of us for so long, we may take them for granted. Not me. Sit down some night and go over everything... Ron and Jud will surface time and time again. Stellar supporters and just downright good guys. Part of the whole cycle that makes it all work. They are the best for a reason, there is NO substitute. Rock on.

Just be ready next year to come back again, this IS the buff place to be. And I say that to all of you. The buff coming from the DTBA will go to work for you. Hauled some home myself...

The planets are aligned, take the buff plunge!

"P.S. Many thanks to Boyd Meyer, not only our volume buyer, he proved to be a good sport too!"



Boyd and Grizz take a break during the Winter Conference banquet. Note that Boyd is still smiling...this was prior to him having to buy his spare trailer tire at the Fun Auction!

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Many Thanks From Bruce Anderson, Immediate Past President

By Bruce Anderson, Immediate Past President

Western South Dakota is the "bread basket" of the buffalo industry. Always has been, always will be. The Dakota Territory Buffalo Association is the voice of this "bread basket". We are the "producer's association". While I have not been to all the various regional association meetings, I have been to enough of them to know that we are unique. We are large. We are powerful. We have exceptional members. We are a voice that gets listened to. I am proud to have served as the president of this organization. I hope I have done a good job, and that my name gets mentioned along with all the others that have served and done a fantastic job of being president.

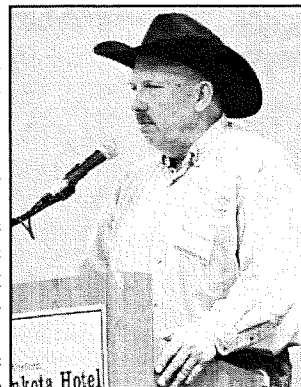
Another unique aspect of our association is the willingness of our membership to "step up". Zane, Chad, Larry, Scott and all the others that volunteer their time. I would like to say thanks to all of the volunteers. Also our board of directors Mimi, Wendy, Larry, Chad and John have been a pleasure to work with.

And then there is Karen. We are indeed lucky to have an executive director that is as passionate about the industry as any one

of us. She has been an enormous help to me. The energy that Karen devotes to this industry cannot be measured. I want to take this opportunity to give Karen a personal "thank you" for helping me with all my duties both with DTBA and with Western Buffalo Company.

I would also like to give my wife Martha a great big thank you. She gets to put up with the phone calls at the supper table, the distracted husband and the constant buffalo talk.

Lastly I want to challenge the next generation of buffalo leadership to keep this organization strong. Speaking strictly from my experience, it is very worthwhile.



Then DTBA President, Bruce Anderson, moderates a discussion during the conference.

Winter Conference Offered Plenty Of Opportunity For Member Input

The DTBA annual conference and show and sale was well attended and offered plenty of opportunities for member input and suggestions.

The weekend got underway with a mini-Bison Advantage workshop on Friday afternoon. John Cammack, Wendy Hutchinson and Bruce Anderson led presentations for a group of nearly 20 participants with varying levels of experience in the industry. Topics covered included the nuts and bolts of bison production; non-traditional start-up methods and an overview of the meat industry.

On Saturday, following the general membership meeting, the slate of speakers got underway for the day, including an update on the National Bison Association activities by NBA Executive Director, Dave Carter; Bison Purity Issues with Michael and Kathleen Gear; and The Price Is Right, a look back at historical bison price data and what it all means, facilitated by Wendy Hutchinson, Bruce Anderson and Chad Kremer. Throughout the day, there was much discussion and input from the membership. It was also noted that this meeting was the fifteenth anniversary of the DTBA and a number of charter members were in attendance. Jud Seaman asked them all to stand up and be recognized at one point during the meeting.

Throughout the course of the day, several topics came up, and were identified, as topics of concern or that would be of interest in learning more about. Financing for the buffalo industry, whether to get started, expand or even continue operations, was noted as being one of the biggest obstacles for industry growth. Suggestions included better communication in the marketing

area; educating the financial/banking community about our industry and current market values; credit and financing options; and perhaps even creating a program with a mock business plan that would walk producers through the steps needed to create a business plan that could be taken to bankers and stand up as a valid plan.

Other thoughts included making sure that producers are being efficient and using all the tools available to them; converting beef producers into buffalo producers; ensure that producers keep their standards high during this time of expansion, ie not all animals need to go back into the breeding herd - set standards and adhere to them and don't sell animals that should be culled, etc.

During the final portion of the afternoon business meeting, questions were asked of the morning presenters and Tom LeFaive spoke briefly about the Bison Conservation Group and its purpose and structure and invited those in the meeting to comment and have input on the group's activities.

At the conclusion of the afternoon session, the group then returned to the business meeting and the election of directors. Three candidates, John Cammack, Travis Mickelson and Marielle Graese, were running for two positions, with Cammack being re-elected for another term and Graese joining the board for her first three-year term.

Following the evening banquet, awards were presented for the winners of the Black Hills Buffalo Classic Show. Outgoing board members, Bruce Anderson and Chad Kremer, were recognized for their service to the association. The Fun Auction rounded out the evening entertainment and was a rousing success!

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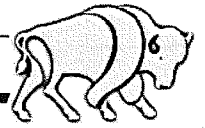
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2011 Black Hills Buffalo Classic Show and Sale Results

Hosted By Dakota Territory Buffalo Association • February 6, 2011 • Rapid City, SD



Peter Cook and Ryan Homelvig accept the Producer of the Year trophy from Lynnette Laird and Rod Sather, who co-sponsored the trophy with Scott and Susan Peterson.

Producer of the Year: KenMar Buffalo Ranch, Ryan Homelvig & Peter Cook, New Rockford, ND

Rookie of the Year: Needles View Ranch, LLC, Dave Reyelts, Rapid City, SD

Grand Champion Male: A Young Guns Yearling Bull from Cold Creek Buffalo Company, Boyd & Allison Meyer, Windsor, CO. Sold for \$16,500 to Sandy & Jacki Limpert, Slim Buttes Buffalo Ranch, Buffalo, SD.

Reserve Champion Male: A Yearling Bull from KenMar Buffalo Ranch. Sold for \$4,600 to Kevin & Joan Stormo, Tatanka Hills, Lake Norden, SD.

Grand Champion Female: A Two Year Old Bred Heifer from Needles View Ranch. Sold for \$3,100 to Doug Candee, Antelope Creek Bison, Gladstone, ND.

Reserve Champion Female: A Heifer Calf from Nolz Poor Farm Bison, Ed & Deanna Nolz, Sioux Falls, SD. Sold for \$2,250 to Larry & Dixie Byrd, Trails End River Bison, Presho, SD.

Yearling Bull

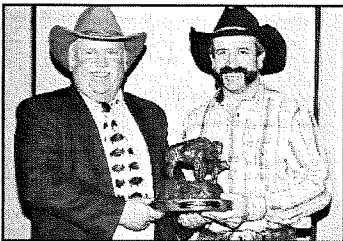
1. KenMar Buffalo Ranch; 2. KenMar Buffalo Ranch; 3. Cammack Buffalo Ranch, John, Lane & Mike Cammack, Stoneville, SD

Young Guns Yearling Bulls

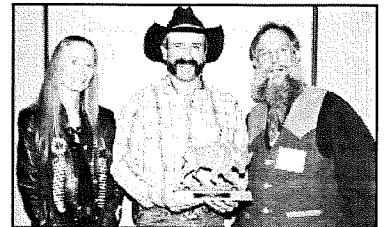
1. Cold Creek Buffalo Company; 2. Cold Creek Buffalo Company; 3. Custer State Park, Chad Kremer, Herd Manager, Custer State Park, SD



Trophy sponsors Sandy and Jacki Limpert present the Grand Champion Bull trophy to Boyd Meyer.



Frank Kralicek presents the Rookie of the Year trophy on behalf of sponsor, Frank Kralicek, Jr. Accepting on behalf of winner Dave Reyelts is Chad Kremer.



Chad Kremer, center, accepts the Grand Champion Heifer trophy for Dave Reyelts. Kathleen and Michael Gear were the sponsors.

Top Five Bull Calves

1. Butler Ranch, Jim Butler, Faith, SD; 2. Northstar Bison, Sean, Renee & Marielle Graese, Rice Lake, WI; 3. Veronica Gerard, Kennebec, SD

Bull Calf

1. Nolz Poor Farm Bison; 2. Northstar Bison; 3. Northstar Bison

Heifer Calf

1. Nolz Poor Farm Bison; 2. KenMar Buffalo Ranch; 3. Horse Creek Bison, Steve & Roxann McFarland, Hettinger, ND

Heifer Calf

1. Nolz Poor Farm Bison; 2. KenMar Buffalo Ranch; 3. Horse Creek Bison

Top Five Heifer Calves

1. Nolz Poor Farm Bison; 2. Butler Ranch; 3. Veronica Gerard

Two Year Old Bred Heifer

1. Needles View Ranch, LLC

Reality Based Carcass Class Bull

1. KenMar Buffalo Ranch, Peter Cook; 2. Cammack Buffalo Ranch; 3. Butler Ranch

Reality Based Carcass Class Heifer

1. Blue Valley Ranch, Perry Handyside, Mgr., Tim Robertson Livestock Foreman, Kremmling, CO; 2. KenMar Buffalo Ranch, Peter Cook; 3. Veronica Gerard.

Sale Results

Yearling Bulls: 6 head sold. Prices ranged from \$1,500 to \$4,600 with an average of \$2,667 per head.

Young Guns Yearling Bulls: 16 head sold. Prices ranged from \$1,800 to \$16,500 with an average of \$4,419 per head.

Top Five Bull Calves: 20 head sold. Prices ranged from \$1,200 to \$1,450 with an average of \$1,313 per head.

Bull Calf: 5 head sold. Prices ranged from \$1,050 to \$2,700 with an average of \$1,850 per head.

Heifer Calf: 4 head sold. Prices ranged from \$1,250 to \$2,250 with an average of \$1,563 per head.

Top Five Heifer Calves: 20 head sold. Prices ranged from \$1,300 to \$1,400 with an average of \$1,338 per head.

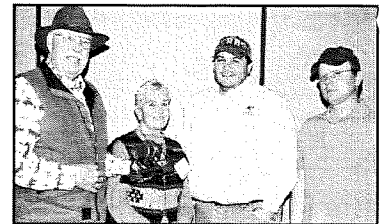
Two Year Old Bred Heifers: 1 head sold. Price was \$3,100.

Premium Yearling Heifers: 10 head sold. Prices ranged from \$1,500 to \$1,650 with an average of \$1,575 per head.

Premium Heifer Calves: 38 head sold. Prices ranged from \$1,025 to \$1,250 with an average of \$1,117 per head.

Premium Bull Calves: 19 head sold. Prices ranged from \$1,250 to \$1,400 with an average of \$1,321 per head.

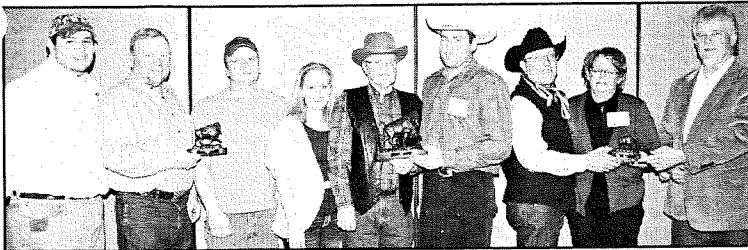
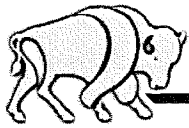
Premium Yearling Bulls: 5 head sold. Prices ranged from \$2,150 to \$3,000 with an average of \$2,430 per head.



Dan and Pat Huber present the Reserve Grand Champion Bull trophy to Peter Cook and Ryan Homelvig.



Ed and Deanna Nolz accept the trophy for Reserve Grand Champion Heifer. John Cammack presented the award for sponsors Wayne and LeAnn Buchholz.



Peter Cook and Ryan Homelvig accept the Silver Trophy for their Heifer Calf entry from Larry Carr, representing sponsor Linweld. The Nolz family picked up the Gold trophy in the class, presented by John Cammack on behalf of sponsor Travis and Haley Mickelson and Steve and Roxann McFarland took home the Bronze trophy, presented by Mark Barry.



Parker Handyside and John Cammack present Boyd Meyer, center, with the Gold and Silver trophies for the Young Guns Yearling Bull Challenge. Chad Kremer presented the bronze award to himself for the Custer State Park entry in the class!



Zane Holcomb presented Jim Butler with the Gold trophy for the Top Five Bull Calves class while Marielle and Sean Graese accept the Silver award from Moritz Espy. Veronica Gerard took home the Bronze trophy, presented by Doug Woodall for sponsor Standing Rock Sioux Tribe.



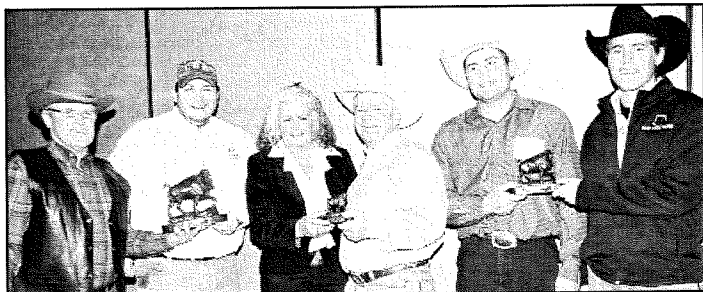
Dan Huber presents the Gold Yearling Bull trophy to Rayn Homelvig and Peter Cook while Claudia Barry, on behalf of sponsor Fischer Rounds, also presents the pair with the Silver trophy. Brodie and Samantha Limpert (and Zoey, too!) present John Cammack with the Bronze Yearling Bull award.



Ed Nolz accepts the Gold Bull Calf trophy from Evie Woodall and Felicia Sargeant and Chandler Kuck presents Marielle Graese with the Silver trophy and Sean Graese accepts the Bronze trophy from Steve McFarland, representing sponsor Erickson's Meat Market.



Boyd Meyer presents Jim Butler with the Silver trophy for his Top Five Heifer Calves entry while the Nolz family picks up the Gold trophy from Moritz Espy and Veronica Gerard took home the Bronze, presented by Mark Barry.

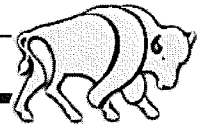


Ed Nolz presents the Gold trophy for Carcass Bulls to Peter Cook while Susan Maass presents the Bronze award to Jim Butler and Parker Handyside awards the Silver trophy to John Cammack.



Ed Nolz, representing sponsor Renner Corner Locker, presents the Silver Carcass Heifer trophy to Peter Cook as Bruce and Martha Anderson hand out the Gold trophy to Tim Robertson and the Bronze trophy to Jim Butler.

CONGRATULATIONS TO ALL THE ENTRIES AT THE 2011 BLACK HILLS BUFFALO CLASSIC!



DTBA Members Make A Good Showing At NBA Events

This past January saw a number of DTBA members pick up awards and recognition at the National Bison Association Winter Conference and Gold Trophy Show and Sale.

Congratulations to Boyd Meyer, Cold Creek Buffalo Company, Windsor, CO, who was named the NBA Member of the Year. Boyd was recognized for his leadership and innovative ideas he has brought forth to the industry in recent years. Boyd was the driving force behind the establishment of the Bison Advantage workshops and he was also instrumental in bringing the new Ranch Ready Pen of Five Yearling Heifer class to the Gold Trophy event.



Boyd Meyer receiving the NBA Member of the Year award.

Boyd currently serves on the NBA Board of Directors as the Region 2 director and he also serves on the board for the Rocky Mountain Buffalo Association and the Western Bison Association.

Boyd has been a great member and supporter for DTBA and we are proud to have him in our ranks and congratulate him on a well deserved honor!

It's also worth noting that Boyd was named the Market Class Producer of the Year this year for his carcass entries. He picked up a second place in the Bull Market Class and first place and third place in the Heifer Market Class with his entries. He also placed in the live animal classes with fourth place in the Yearling Heifer class, third place in the Ranch Ready Pen of Five Yearling Heifer class, second and fifth in the Two Year Old Bred Heifer class.

Larry and Dixie Byrd, Trails End River Bison, Presho, SD, were named the Producer of the Year at the Gold Trophy Show and Sale. They have won the award numerous times, but it takes dedication and hard work to continue to pick up the awards year after year. They took home a number of awards, including first place and Grand Champion Female honors for their yearling heifer entry; first place in the Ranch Ready Pen of Five Yearling Heifer class; first place and Grand Champion Male honors for their yearling bull entry and second place in the Two Year Old Bull class. Congratulations, Larry and Dixie!

Other DTBA members made a good showing in Denver, including: Dick Gehring, Gehring Feeders, Moundridge, KS, first place in the Bull Market Class and second place in the Heifer Market Class. Mike Duncan, Diamond Tail Ranch, Jelm, WY, picked up third in the Bull Market Class while Ray Thieman, Prairie Ridge Buffalo Ranch, Limon, CO took home fifth place in the Bull Market Class.

In the live animal classes, other winners included Casey Byrd, Buffalo Dance Bison, Presho, SD, picking up a third in the yearling heifer class and first place and Reserve Grand Champion female for his Two Year Old Bull entry.

Diamond Tail Ranch also took home the second place award for their Ranch Ready Pen of Five Yearling Heifers and Lance Kuck, Laughing Water Ranch, Bassett, NE, was awarded fourth place for his entry in the same class and Mimi Hillenbrand, Triple Seven Ranch, Rapid City, SD, took home fifth place in that class.

KenMar Buffalo Ranch, Ryan Homelvig, Peter Cook and Wayne Cook, New Rockford, ND, were awarded second and fourth place for their entries in the Heifer Calf Class and another entry took home the People's Choice award. They also picked up first place in the Pen of Five Heifer Calf class.



Larry and Dixie Byrd with the Gold Trophy Show and Sale Producer of the Year award.

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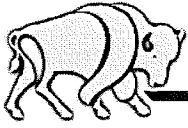
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Buffalo Foundation Fundraiser

With the theme set as Pirates of the Prairie, the auction committee has been busy planning all of the other aspects of the 18th



NATIONAL BUFFALO MUSEUM

Annual North Dakota Buffalo Foundation Fundraiser Auction. This year's fundraiser will be held on Wednesday, June 8 at the Jamestown Civic Center. Plan on attending, as this is the only major fundraising event for the Foundation. All proceeds go to support the operating expenses of the museum and the herd.

The social, featuring hors d'oeuvres by Dianna Johnson with specialty beer and wine tasting, will get underway at 5:30 p.m. A bison prime rib buffet dinner will follow the social and the live auction will get underway at 8:15 p.m. Chef Dan Bakken, back by popular demand, will prepare the prime rib roasts this year and Aramark will prepare the rest of the meal.

Raffles have been very popular and we are bringing back the most popular ones from last year, including the "Briefcase" raffle, the "Purse" raffle and the "Pick of the Herd" raffle. All of these raffles, along with a variety of other ones, will make some lucky winners very happy!

There are still items available for sponsorship for this year's fundraiser. Anyone interested in sponsoring items is encouraged to call the museum at (701) 252-8648 or Auction Sponsor Chairman, Jay Thompson, at (701) 252-3040 for more information. This is an excellent way to support the museum and receive a tax-deductible receipt. There are a wide variety of items and price points to choose from.

Tickets for the fundraising event are \$40 per person, \$280 for a table of eight or \$525 for VIP tables. The price includes the specialty beer and wine for the entire evening, sodas, hors d'oeuvres and the prime rib dinner. They are expecting a sellout before the June 8 event. To reserve your tickets, call the museum at (701) 252-8648 with a credit card or mail a check to the National Buffalo Museum, 500 17th St SE, Jamestown ND 58401.

Be watching for more information on the city of Jamestown's buffalo celebration, White Cloud Days and Tatanka Festival, scheduled for July 7-10 in Jamestown, ND.

Scotty Philip Days July 16-17

The town of Philip, SD, is making plans to commemorate the 100th anniversary of the death of the town's namesake, James "Scotty" Philip. Philip is widely known for his role in saving the buffalo from extinction and the town of Philip was named after him to acknowledge his role in its establishment.

The weekend of July 16 and 17 will be the kickoff for the Bad River Trail Ride, the highlight of the anniversary celebration. The trail ride/wagon train will leave Philip on July 17 and head to Ft. Pierre via the historic Bad River Trail, which served as a major route to the region's hub cities of Pierre and Ft. Pierre. The ride will take participants through several counties and old communities, many of which are no longer viable. Additionally, the group will be passing through Ted Turner's Bad River Ranch on their way to Ft. Pierre and will hopefully experience the ranch's buffalo out on the plains!

On Saturday, July 16, the community is hosting a number of activities to get the celebration underway. The local Horizon's group will be unveiling a bust of Scotty Philip that was created by artist Ray Kelly. Kelly is also creating a drawing that will be auctioned off during the weekend.

There will be presentations by dance groups, lots of fun music, a horse race, buffalo burgers served for lunch and a presentation by Sheilah Philip, a relative of Scotty, on the life of this extraordinary man.

Organizers have also announced the Cody, the trained buffalo owned by Mike Fogel, Houston, Minnesota, will join the celebration and offer opportunities for people to see a live buffalo up close and personal!

For more information about the Scotty Philip Days events, go to <http://scottlyphilipmemorialwagontrain.blogspot.com/>. Links for information about the wagon train and contacts for more information about all the events can all be found on the site.



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A Heartfelt Thanks To Those Who Make the DTBA A Success!

On behalf of the Dakota Territory Buffalo Association, we'd like to take the opportunity to thank all of our sponsors who make our show, sale and conference possible. Additionally, without our consignors and buyers, there would be no sale to speak of, so a big thank you to them as well. Your support of the association is what makes our success possible. For all of our members who donate items for our Fun Auction and those of you who purchase those items, a huge thank you. Each and every donation makes a difference in the ability of our association to continue moving forward to promote and educate about our favorite animal, the buffalo! The generosity shown by our membership is outstanding and each one of you deserves a share of the credit for making our events possible and successful!

2011 Black Hills Buffalo Classic Trophy Sponsors

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2011 BHBC, Premium Auction & Carcass Class Consignors

777 Ranch, Mimi Hillenbrand; Blue Valley Ranch; Butler Ranch, Jim Butler; Cammack Brothers, John, Lane and Mike Cammack; Catron Ranch, Mike Thiel; Cold Creek Buffalo Company, Boyd & Allison Meyer; Custer State Park; Elk Pass Ranch, Dan and Pat Huber; Heart River Bison, Doug Paulson; Horse Creek Bison Co., Steve and Roxann McFarland; Jumpoff

Buffalo Ranch, Scott and Susan Peterson; KenMar Buffalo Ranch, Ryan Homelvig and Peter Cook; Laughing Water Ranch, Lance and Tahma Kuck; Montana Mountain Bison, Cory and Becky Marquis; Mosquito Park Enterprises, Rod Sather; Needles View Ranch, Dave Reyelts; Nolz Poor Farm Bison, Ed and Deanna Nolz; Northstar Bison, Marielle, Sean and Renee Graese; Skull Creek Bison, Wayne and LeAnn Buchholz; Slim Buttes Buffalo Ranch, Sandy and Jacki Limpert and Brodie and Sam Limpert; Veronica Gerard.

2011 BHBC & Premium Auction Buyers

Randy Faessler, Sidney, NE; Dan Huber, Elk Pass Ranch, Steamboat Springs, CO; Chad Heim, Heim Buffalo Ranch, Ashton, SD; Chris Kremer, Summit Lake Bison, Reading, MN; Wayne Moser, Wind Creek Ranch, Lemmon, SD; Dave Reyelts, Needles View Ranch, Rapid City, SD; Dan Meyer, Hidden Bison Ranch, Sauk Centre, MN; Cory Marquis, Montana Mountain Bison, Belt, MT; Peter Cook, KenMar Buffalo Ranch, New Rockford, ND; Don Wojohn, Windy Hill Bison Ranch, Wibaux, MT; Doug Candee, Antelope Creek Bison, Gladstone, ND; Kevin Stormo, Tatanka Hills, Lake Norden, SD; Larry Byrd, Trailes End River Bison, Presho, SD; Bill Melius, Double Diamond Buffalo Ranch, Faulkton, SD; Sandy and Jacki Limpert, Slim Buttes Buffalo Ranch, Buffalo, SD; Kevin Casey, Riata, LLC, Rapid City, SD; Robert Penn, Sturgis, SD; Boyd Meyer, Cold Creek Buffalo Company, Windsor, CO; Scott Peterson, Jumpoff Buffalo Ranch, Buffalo, SD.

2011 Winter Conference Speakers and Presenters

Bruce Anderson, Western Buffalo Company; Chad Kremer, Custer State Park; Wendy Hutchinson, Longreach Buffalo Company; Dave Carter, National Bison Association; Michael and Kathleen Gear, Red Canyon Ranch; John Painter, Painter Construction Company; Dr. Dustin Oedekoven, SD State Veterinarian; John Cammack, Cammack Brothers; The membership of the DTBA! Thanks also to John Cammack, Travis Mickelson and Marielle Graese for taking the time to run for two positions on the Board of Directors.

Volunteers Who Help Anytime, Anywhere!

Bruce Anderson, Chad Kremer, Suzi Kremer, Zane Holcomb, Wendy Hutchinson, John Cammack, Melanie Cammack, Felicia Sargeant, Doug Woodall, Evie Woodall, Susan Maass, John Painter, Sandy Limpert, Jacki Limpert, Larry Carr, Ron Bradeen, Jud Seaman, Tom Martin, Joe Dickman, Rod Sather, Todd Goetz, Jake Meyer and so many others! Your time and talents are much appreciated and your contributions are invaluable. Thank you so much for all your assistance!

Hopefully we haven't missed anyone in the thank you's! Everyone contributes in some way to make the DTBA such a great association. *Thank you all* for your continued support and input.

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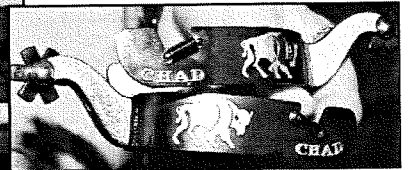
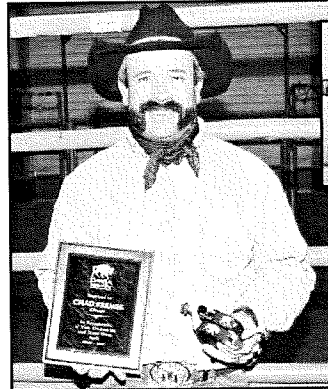
MEMBERS



The DTBA has been going strong for 15 years, thanks to a group of charter members who gave the DTBA its start and many of whom continue to be active members. At the Winter Conference, the charter members in attendance were recognized for their dedication to the association. Back row, left to right: Ed Nolz, Joan Stormo, Deanna Nolz, Roy Liedtke, Sandy Limpert, Jacki Limpert, Rod Sather, Doug Woodall, Dixie Byrd, Larry Byrd, Jud Seaman and Bill Melius. Front row, left to right: Chad Heim, Kevin Stormo, Chad Kremer, Zane Holcomb, Jim Butler and Steve McFarland.



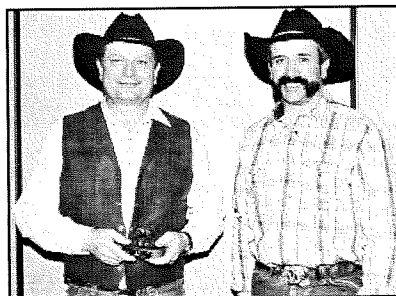
Bruce Anderson, presents Mimi Hillenbrand with a "Friend of the DTBA" award at the Welcoming Reception at Prairie Edge on Friday night. Mimi was recognized for her enthusiasm and dedication to the DTBA. Every year she hosts the Welcoming Reception and over the years she has hosted numerous seminars and presentations at her 777 Ranch, all at no cost to the association or members. Her generosity has allowed many to benefit and learn and we thank Mimi for all she does for the association and the industry!



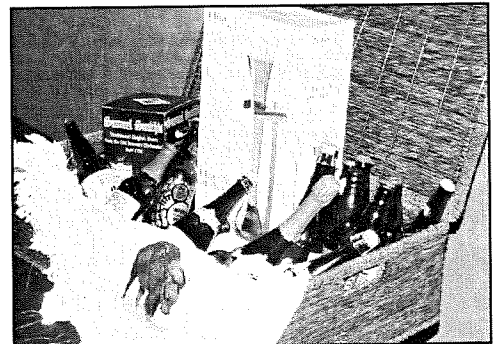
Outgoing board member, Chad Kremer, was presented with a plaque to acknowledge his service to the association. Additionally, after a two year wait, he received a pair of customized spurs to commemorate his term as president of the association.



Winter Conference attendees enjoy the Welcoming Reception at Prairie Edge in downtown Rapid City on the Friday evening prior to the conference. A great opportunity to shop, socialize and enjoy the fantastic food.

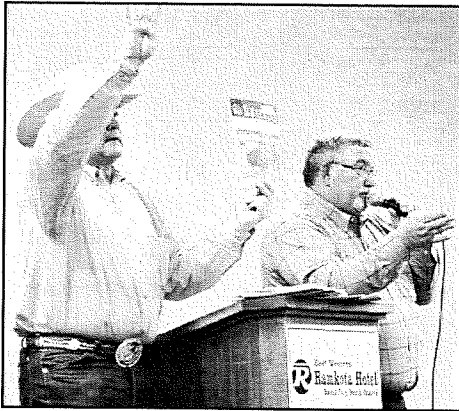


Outgoing Black Hills Buffalo Classic judge, Kelly Hardy, is presented with a Thank You bronze by Chad Kremer.



Outgoing President, Bruce Anderson, was presented with a large assortment of beverages as a thank you for his service to the association. Bruce is known for his fondness of "wierd beers", as Karen terms it, and unbeknownst to him, he was set up at in the hospitality room at a meeting in North Dakota. During the evening's sampling of assorted beers, notes were taken and this basket was customized based on his likes. It was tough work, but well worth it to know that Bruce can spend time sampling all his favorites!

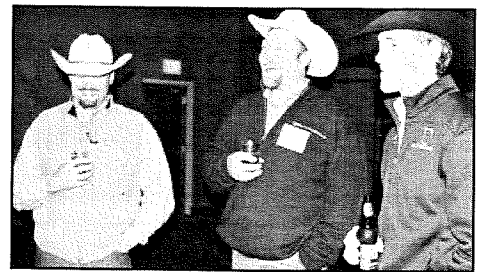
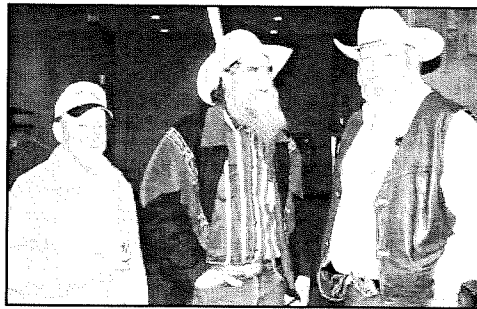
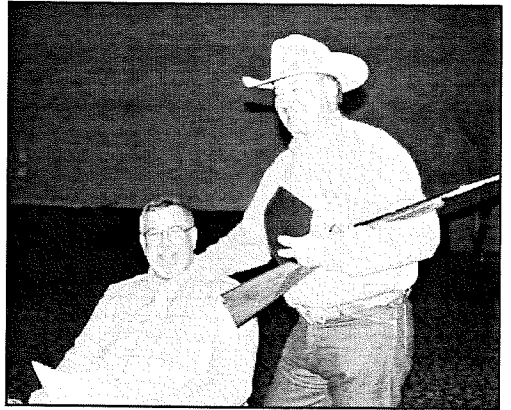
THANK YOU!



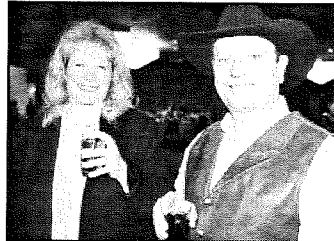
The dynamic duo, Ron Bradeen and Jud Seaman, auctioneers extraordinaire! At left, Jud sells the Fun Auction while Ron catches bids from the crowd. At right, Ron takes a break from selling raffle tickets and is obviously working out a game plan with Jud for the Fun Auction.

These two men are masters at working the crowd during the Fun Auction while still keeping everyone laughing and having fun. Their professional skills shine at the live animal auction and they work very hard to get every dollar they can for the association.

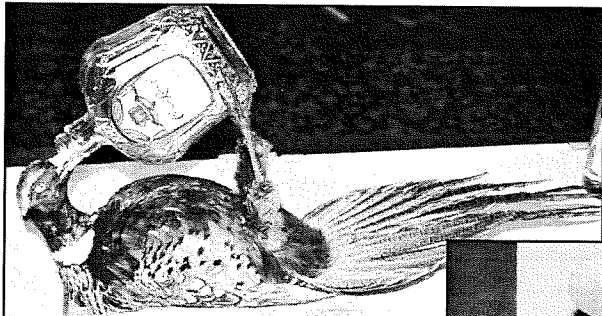
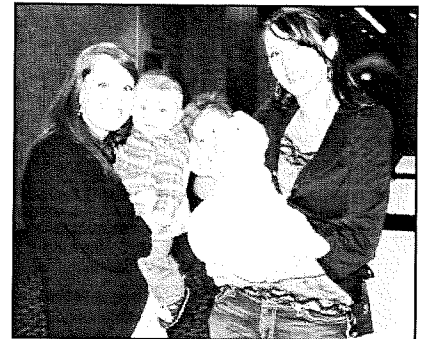
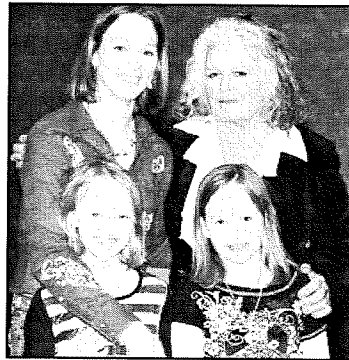
Thank you, Ron and Jud, for all you do for the DTBA and the buffalo industry. We couldn't do it without both of you! And really, who would want to?



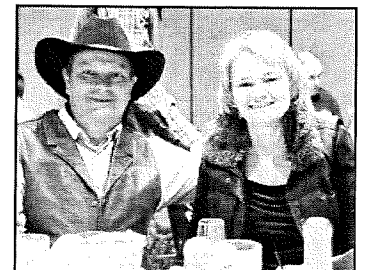
The last few years, it seems like someone dreams up a really creative idea and turns it into a Fun Auction blockbuster. Remember those sombreros? Well, this year Bruce Anderson gets the gold star for producing t-shirts and bumper stickers with the above message on them. They were a huge hit and somehow, everytime Ron announced that he had found the last one, he would magically discover just one more lurking under the table! Plenty of laughter and it appeared that by the end of the auction, nearly everyone was able to take one of these priceless goodies home...for a price! Great job, Bruce! And Ron and Jud for selling them for just a bit over market value!



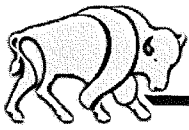
2011 Winter Conference



Ron Bradeen found this great-looking pheasant and once the appropriate Crown bottle was supplied, he presented the guzzling bird to our favorite International Social Director, Rod Sather. Rod is an avid hunter and a number of buffalo friends have spent time during hunting season at the Muddy Boot and we're pretty sure this bird will find its way to the Boot in time for opening weekend! Thank you, Rod, for all you do to promote social skills among the buffalo crowd. You are the BEST!!



Photos by Wendy Hutchinson & Karen Conley



Work Begins On Sequencing Bison Genome

Researchers Working to Unlock the Secrets of Bison Genetic Make-Up

Press Release From The National Bison Association

Call it The dart shot heard round the bison world.

With a dart fired by Dr. Dave Hunter at the Flying D Ranch in Montana last month, a team of scientists formally began the process of sequencing the entire bison genome.

Hunter, along with Dr. Steve Olsen of the with the National Animal Disease Center in Ames, IA, , Dr. James Derr of Texas A&M University, and a Texas A&M graduate student Lauren Dobson, selected a mature bull that is part of the Yellowstone Park Quarantine herd being housed at Ted Turner's Flying D Ranch south of Bozeman. Hunter then anesthetized the bull with a dart gun, and the scientists collected a series of blood, hair, and tissue samples.

"We even named him Templeton, in honor of Joe Templeton, a pioneer in genetics research," Hunter said in describing the event.

Texas A&M will first analyze the samples to determine the genetic characterization of the animal, and to verify that the bull provides a good representation of the species. Scientists at The ARS lab at Iowa State University will then begin the complex process of sequencing the genome.

Olsen explained, "It's like a jigsaw puzzle, where you want to get to the point where the pieces line up." He noted that the samples collected from Templeton will use used to develop "fibroblast cell lines" to grow cells that will be used as sources of DNA to be compiled into a type of library for sequencing. Those samples can then be preserved for extensive periods of time.

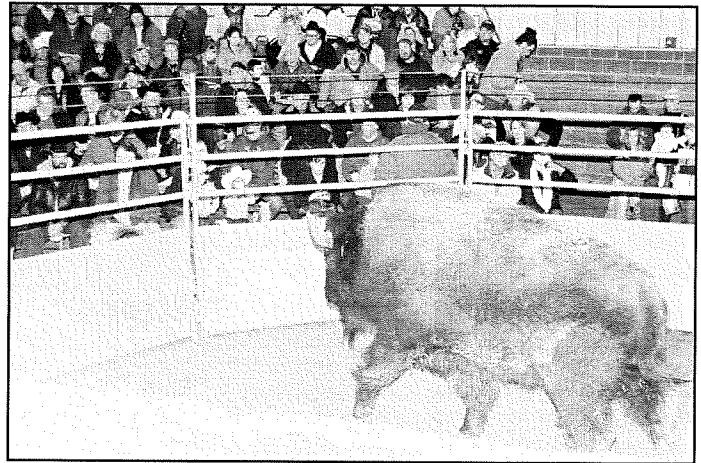
Hunter added that new equipment at Iowa State allows scientists to make longer strands of DNA that are easier to analyze. Using Olsen's jigsaw puzzle analogy, Hunter said, "It's easier to complete the puzzle when you have bigger pieces."

The initial genome is being sequence De Novo, meaning that it will be analyzed without a reference point to any other species. According to Hunter, that will provide a solid baseline for identifying unique characteristics in bison.

The scientists agree that the mapping of the bison genome will provide the industry with a new set of tools. How those tools will be utilized, will be determined in the coming years.

Hunter noted, "One of the things we may be able to determine is why bison do not respond to some of the vaccines that are regularly used in cattle."

The sequencing of the DNA from the first sample may be completed sometime this fall. The process for the initial animal is estimated to run \$400,000, but subsequent samples will cost between \$50,000 - \$60,000. The USDA Agricultural Research Service is largely underwriting the initial sequencing project in collaboration with scientists at Iowa State University, Texas A&M, and the University of Maryland. The National Buffalo Foundation in January also donated \$25,000 for the sequencing project.



The Grand Champion Bull, a Young Guns Yearling Bull Challenge entry from Cold Creek Buffalo Company, makes his way around the sale ring during the Black Hills Buffalo Classic sale.

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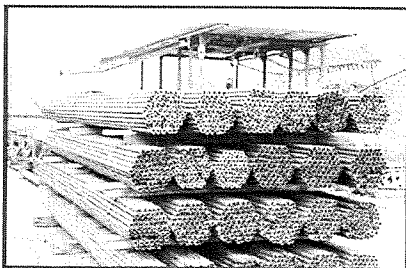
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A Brief Look At The Evolution Of Bison

By Kathleen O'Neal Gear and W. Michael Gear
©August, 2010

THE BOS FAMILY

Bison and cattle have a common ancestry that begins around nine million years ago in Europe with the appearance of an animal called *Parabos* (Mammalia - Artiodactyla - Bovidae). The oldest *Parabos* fossils are found in Spain, but there are also sites containing *Parabos* in Romania, Italy, Moldova, and the most recent evidence is found in Hungary, indicating that *Parabos* survived until about 1.8 million years ago.

The reason *Parabos* is of interest to us is that around 4 million years ago in China, it gave rise to *Proleptobos*, an animal that is the direct ancestor of both *Bos* and *Bison*.

Bos-*Bison* branches from *Proleptobos*-*Leptobos* around 2.2 million years ago and begins rapidly radiating across Europe and Asia. The climate was deteriorating, heading into the Pleistocene Ice Age, which began about 1.8 million years ago. As the forage quality diminished with the increasing cold, competition among large herbivores also increased. The more specialized and efficient grazers and browsers became larger-bodied, and developed more body hair and horns in both sexes, perhaps to fight predators, or for sexual selection, probably both. *Bison* evolved further north than any other Bovini genus and was obviously best adapted to the colder temperatures of the late Pliocene and early Pleistocene.

Bos and *Bison* split approximately 1.5 million years ago. As the Pleistocene glaciers advanced around the world (at its peak, about 30% of the earth's surface was covered by glaciers), *Bison* adapted to the dramatically changing environments. *Bison* were confined to the temperate zones of east Asia until after the Donau glaciation, around 550,000 years ago. By 450,000 years ago they had spread into southeastern and central Europe, and by the late Wurm glaciation (15,000 years ago) they'd become common fossils, as well as showing up in cave paintings throughout much of Europe-like the Altamira cave site in Spain.

The Old World *bison* population split into two groups: 1. A rare short-horned woodland wisent, *Bison schoetensacki*, and the large steppe wisent that we are all familiar with, *Bison priscus*.

B. priscus first reached North America during the Mindel-Riss epoch, a global warming period that lasted from 380,000 years ago to around 200,000 years ago. *B. Priscus* crossed the land bridge that connected Asia and North America, known as Beringia, and entered what is today Alaska. *B. Priscus* survived in Alaska, Beringia, and parts of Canada until around 12,000 years ago, as documented at the Old Crow archaeological site in the Yukon.

There were two migrations of *B. Priscus* from Beringia into North America. The first during the Mindel-Riss period gave rise to the giant-horned bison, *Bison latifrons*. The second migration of *B. Priscus* occurred during the late Sangamonian, another warm period, around 130,000 years ago, and gave rise to *Bison bison*. *B. latifrons* survived until around 21,000 years ago, as dated from the Rainbow Ranch site in Idaho. Its extinction probably resulted from competition with *B. bison* and from genetic swamping.

In an article in the journal, *SCIENCE*, entitled, "Rise and Fall of the Beringian Steppe Bison," Beth Shapiro, et. al., using mitochondrial DNA, discovered that the most recent common ancestor (MRCA) of all bison in their study lived around 136,000 years ago, which "suggests that late Pleistocene bison from the Ural Mountains to northern China are descendants of one or more dispersals from North America." The article goes on to say that sev-

eral North American bison maternal lineages fall within the European clade (a clade is a branch on the family tree), which means that the traffic didn't just move one way. *Bison* wandered back and forth across Beringia from North America to Asia for thousands of years.

From about 60,000 to 25,000 years ago, bison were widely distributed across Beringia and moved down an ice-free corridor along the face of the Rocky Mountains into central North America. However, between 22,000 to 18,000 years ago, the Ice Age reached its glacial maximum. At its worst, 18,000 years ago, three miles of ice covered Hudson Bay in Canada and the ice sheets crept as far south as Illinois and Iowa. There were two massive glaciers, the Cordilleran Ice Sheet and the Laurentide Ice Sheet, that finally met at the Rocky Mountains and closed the ice-free corridor, isolating the bison south of the ice sheets. By 18,000 years ago bison in central North America were sparse. The ice-free corridor opened again, as the glaciers melted back, around 14,000 years ago, allowing bison to move freely from Beringia into North America until around 11,000 years ago, when dense spruce forests across Alberta started to crowd out grasslands, and the development of peatland across western and north-western Canada created new barriers to travel.

Two subspecies evolved from *Bison bison*. 1. *Bison bison antiquus* and, 2. *Bison bison occidentalis*. Both subspecies are found in the Great Bison Belt that extended from Alberta to Texas, and were hunted extensively by PaleoIndian peoples, particularly the Clovis and Folsom cultures.

One of the most important points that Shapiro, et. al., make in their article is that "modern bison are descended from populations that were south of the ice before the LGM (the Last Glacial Maximum, 18,000 years ago), and that...all modern bison belong to a clade distinct from Beringian bison. This clade has a MRCA (most recent common ancestor) between 22 and 15 ky B.P."

This MRCA is different from the ancestor that dates to 136,000 years ago because that clade included all bison in Shapiro's study, many of which were not modern bison but prehistoric species of bison. The best way to visualize this is to imagine a family tree with many branches. The large branch that contains the ancestor from 136,000 years ago has smaller limbs growing from it, one of which contains the ancestor of all modern bison and dates to between 22,000 to 15,000 years ago.

Around 4,000 to 5,000 years ago, the Plains Bison, *Bison bison bison*, and the Wood Bison, *Bison bison athabasca* evolved. Plains bison seem to have evolved from *B. bison antiquus*. Wood Bison are more difficult to access. Some researchers say that *B. b. athabasca* descends from *B. b. occidentalis*. Others say that Wood bison descended directly from *B. b. bison*. A recent article in the journal *MITOCHONDRION*, by Douglas, et. al. (11 (2010)166-175), says, "wood bison may never have been a genetically distinct subspecies..." and "current populations of *B. bison bison* and *B. bison athabasca* are not significantly different with respect to their mitochondrial genomic sequences and should not be considered subspecies." More research needs to be done to clarify this issue. Despite being a little dated, one of the best article on this is found in the journal, *GENOME* (42: 483-496, 1999), and written by G.A Wilson and C. Strobeck, "Genetic Variation within and relatedness among wood and plains bison populations."

In the future, good DNA research will fill in more of the gaps in this family tree and we'll have a clearer idea of the details that led to the development of modern bison.



Editor's Note

On pages 14 through 19, you'll find several articles submitted by Michael and Kathleen Gear. The Gears spoke at our Winter Conference, addressing the hot button topic of purity in the bison industry. Numerous articles have appeared in newspapers and magazines throughout the country touting the "purity" of certain public and conservations herds while seeming to imply that privately owned animals are not pure, but are infused with cattle genes, thus making them substandard to the "pure" bison. With this in mind, conservation groups have been seeking to have these "pure" bison placed on the Endangered Species List. There is much concern that if this should happen, what would happen to privately owned animals and what would the repercussions of such a listing mean for the bison industry.

The Gears have done extensive research on the subject and the articles on these pages first appeared in the Western Bison Association's (WBA) Bison Review newsletter and were later included in a packet of information presented to the National Bison Association Board of Directors at their Winter Conference.

There was great interest in the Gear's information at our DTBA conference and in the interest of keeping our members informed and educated about this issue, the Gears generously give permission to reprint the articles in the DTBA newsletter. We will continue to keep the membership informed on this issue as new developments warrant.

Basic Principles of Evolutionary Biology And What They Mean For the "Purity Issue" in Bison

By Kathleen O'Neal Gear and W. Michael Gear
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Just as life was leveling out for most of us, yet another menace begins to loom on the horizon. This time it's a "purity" issue. Some strident voices in the environmental community have declared that perhaps less than 6,000 of the hundreds of thousands of buffalo in the United States are genetically "pure" bison. The rallying call is for national legislation declaring pure bison to be an endangered species subject to the Endangered Species Act and regulated by the U.S. Fish and Wildlife Service. If you have any doubts, Google the World Wildlife Fund and read their plans for bison.

The purity problem is complex, an interplay of science, economics, private property rights, down-and-dirty politics, public relations, media attention, funding, and advocacy groups.

Any rational discourse will be hindered by passionate believers. Key word here is believers. Our Random House Dictionary defines "believe" thus: "To have confidence in the truth, the existence, or the reliability of something, although without absolute proof that one is right in doing so."

Genetic science will provide ammunition for each side. The field of genetics is huge, diverse, and full of sub-disciplines. Just a basic proficiency requires four years of intense university study. To the lay person, it all sounds like Greek--from which most terms are derived. Like it or not, understanding the underlying genetic arguments, pro or con, provide the basis for the purity fight. As producers, we must educate ourselves in basic genetic principles.

The purists will draw heavily from the subdiscipline within genetics known as Genomics. In this case we are talking about the "gene pool", the entire array of genes contained within the bison species. Those pursuing the purity issue make a baseline assumption: "Pure" bison contain those genes, or alleles, which were present prior to the introduction of domestic beef cattle into North America five hundred years ago. According to the extremists, animals that test positive for introgressive, or introduced, beef genes should, at minimum, be managed separately. At best, they should be culled from the herd. Some have suggested placing bison with introgressive genes in a new species, *Bison americanus*. Others insist such bison should be designated "cattle" and managed as such under amenable species regulations. The notion recalls the days when as much as 1/64th African ancestry classified a person as "Negro."

The extremists seek federal regulation, enforcement, and sanction to ensure that no future crosses between "pure" and "impure" bison occur. The scientific term for such action is "eugenics." You might want to look that one up, just to see what happens when eugenics and "purity" become political dogma.

More germane to the bison producer is the question of whether or not he has beef genes in his herd. To put this into context, let's

take a look at a subject called evolutionary biology. The underlying principles here are "natural selection" and "fitness." Natural selection occurs when an individual's genes, his "genotype", instill a survival advantage over his fellows. For example, one bison might have genes that allow him to resist infection by MCF, TB, or anaplasmosis. If he survives and breeds, passing his genes to the next generation, he is considered "fit." It's a simple principle, and the ultimate one in nature.

As an example, neither of the authors have produced children. No matter what our genetic advantages, intelligence, health, or longevity, our genotypes will not pass or contribute to future generations. We're a dead end. Not fit.

In the natural state, "purity" may or may not be a good thing. Everything depends on selective pressure. How do you determine which genetic traits allow an individual to survive and reproduce in a given environment? If he survives and breeds, he is fit. Period.

But environment changes. Pay attention here: In genetic terms, environment consists of everything that has an impact on, or stresses, an organism: climate, nutrition, temperature, predation, diseases, toxins, radiation, you name it. The better an organism copes with its environment, the better it is "adapted." Change the environment from forest to desert, and the organism may well find itself so poorly adapted it is no longer fit.

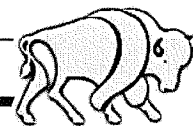
Here's the irony: Genetics tend to maximize traits that allow an organism--bison, rose bush, or bacteria--to successfully adapt to, and exploit, a given environment. Those that flourish tend to be more "fecund", meaning they have more offspring, or better fitness. Their genetic advantages increase numerically through time, tending to homogenize the gene pool with highly adaptive traits suitable for that environment. Genetic diversity dwindles. This is called "specialization."

The problem is that nothing lasts forever. Environments always change. It may be as subtle as the arrival of a new pathogen, or disease--or as blatant as when forests disappear, grasslands turn to desert, volcanoes erupt--or a human hauls a buffalo from northern Alberta to south Texas. The gene pool must remain flexible, providing an organism the ability to adapt to different environmental conditions.

How? With each generation, the entire genotype is reshuffled and halved during the process of meiosis--or sex cell division--which creates sperm and egg. Sire and dam each provide their 50% to create a new 100% at conception. If the newly created genotype is fit, it contributes to the next generation for reshuffling halving, and so on down the line.

Why? Genetic diversity is the key for survival in changing environmental conditions, and we see this reflected in nature. Not only does sexual reproduction exponentially reshuffle the genotype, but genes are obtained, in varying frequencies, from other

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Basic Principles of Evolutionary Biology And What They Mean For the "Purity Issue" in Bison

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species. The process is called "gene flow" and can be defined as the gradual exchange of gene alleles between two populations that can be brought about through migration, contact, or association. As a rule of thumb, the percentage of gene flow increases with the proportion of genetic similarity and proximity of populations. The movement of genes into a genome is called "introgression."

An entire subdiscipline of genetics called "Population genetics" is dedicated to this study. Any introductory text on genetics has at least one chapter dedicated to population genetics.

Vast sections of the human genome consist of genes we have incorporated into our DNA from viruses, bacteria, and protozoa. These are found in what is commonly called the "junk DNA." They appear to have an "epigenetic" effect. Epigenetics have recently been determined to function something like software does in a computer. They turn genes on or off, and modify their expression.

As the Arctic climate changes, we are now documenting crosses between polar bears and brown bears. Should such crosses be hunted down and eliminated as "impure?" In a state of nature, the ultimate determination will be made by fitness.

Last spring, Dr. Svante Paabo's team at the Max Planck Institute for Evolutionary Anthropology in Leipzig, announced that Europeans and Asians contain up to 6% Neanderthal DNA. The question is then begged: Should humans with Neanderthal DNA should be reclassified as *Homo neandertalensis*?

The question is not asked facetiously. Some in the "purist" camp have suggested we reclassify any bison containing beef genes as *Bison americanus*. Let's put this in perspective and draw a human parallel. Ancestral bison developed phenotypic differences from the ancestors of cattle about two million years ago. The ice age--what we call the Pleistocene--restricted ancestral bison and cattle to the same temperate belt across Europe and Asia. During that time ancestral bison and *Bos primigenius* (the ancestor to modern beef cattle) periodically occupied the same territory. While we cannot prove at this time that gene flow occurred between the two species, we definitely can't discount it. And it may be the reason that bison and beef have so many parallel alleles on respective chromosomes. We won't know the degree of genetic divergence until several complete precontact bison-specific genomes have been cataloged.

When bison migrated into North America during the Mindell-Riss warming period 380,000 years ago they remained segregated-but only until the next warming period when herds migrated back and forth across Beringia, reinitiating gene flow between the hemispheres.

In delightful parallel, Neanderthals split from the hominid (ancestral human) line 500,000 years ago. Modern humans migrated out of Africa and into Neanderthal territory 40,000 years ago, and gene flow occurred. Why then, do we hear none of the purists condemning those of us with Neanderthal genes? One of the authors, Michael, has a depression in his skull called a supra-orbital sulcus--a definite Neanderthal trait. (Don't bother to call for his removal from the species--he's already proved "not fit.")

Our concern as producers is as follows: Gene flow is part of nature's plan. Dr. Derr's latest estimate is that, as a whole, our bison may only have 1 to 2% cattle genes. So, if we have beef genes in our buffalo, is it good or bad? And, if bad, at what frequency do we become concerned? Can genetics provide an answer?

Here we must look at the effects of introgression. Alleles entering a genome will have one of three effects: They will be beneficial, neutral, or deleterious. Beneficial alleles increase and animal's fitness. Neutral, well, the name says it. The deleterious alleles decrease fecundity, or at their worst make an animal unfit. Deleterious genes are inevitably removed from the gene pool.

Ultimately, the greater the genetic diversity within a species, the greater the chance that when the environment changes some individuals will remain fit. Here lies the answer as to whether the introgression of cattle genes will be beneficial, or at least neutral. Environments change, growing hotter or colder, wetter or drier. People relocate bison half way across the continent. The neighbor brings in sheep. New pathogens develop, food species change, different predators arrive, toxins are introduced, and unfamiliar parasites appear. Each changes the selective pressure on a species. Species with diversity in their gene pool have a better chance of "preadaptation" meaning that a portion of the population has a genetic trait that makes them fit in the new environment. For example, less fit, small-statured animals with light bone that were selected against in a cool wet period with an abundance of lush grasses, may find themselves more fit in a dry savannah.

The problem with knowing what will be fit in the future is...well, do you know the future? (If you do, we'd like your help picking stock options.) Until we know what's coming--think climate change, new diseases, feed shortages, droughts, radiation, pollutants--we can't even anticipate potential fitness.

Genotypes we may be encouraging today might well be deleterious for fitness tomorrow. Future selective pressure might have nothing to do with a bison's economic value, or whether his DNA has no introgressed cattle alleles. It might boil down to the fact that he has the genetic preadaptation to oxidize an industrial pesticide; he ends up fit while his fellows die.

So where does all this leave us vis-à-vis the "purists?"

First, when evolutionary biology is considered, there is currently no "right" answer. No matter if they are pure or introgressed those bison who survive, are fecund, and produce surviving offspring are fit.

The decision to preserve the pre-contact bison genome is a management decision with benefits for the conduct of scientific research. But it remains a management decision. Neither better nor worse than any other management decision based upon modern conditions and knowledge.

Our current knowledge is deficient. Until we have reconstructed the pre-contact bison genome from a number of prehistoric bison, we have no baseline for comparison. We may discover that a number of alleles currently considered to be "cattle genes" were present in North American bison before cattle were introduced here. As the sample number of prehistoric bison genotypes grows, the greater our confidence in making comparisons to cattle. Until then, management decisions based on purity consist of guessing and "shooting in the dark."

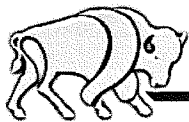
As producers, we shouldn't get too smug about this. We do it all the time, and often with less justification--like culling an open cow when you don't know the reason she's open.

Producers may wish to test their bison for currently identified introgressive "cattle" alleles. What they do with introgressed animals remains a management decision, though it may have political or scientific repercussions. (Producers who create a "pure" herd, and suddenly find themselves regulated by the Endangered

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Michael and Kathleen Gear address the attendees at the DTBA Winter Conference.



Basic Principles...Continued from Page 16

Species Act due to congressional legislation or an executive order, may have second thoughts.) If some of your bison have a percent- age of cattle genes, gain well, yield 70% on the rail, and calve every year, they are fit. Perhaps more so for your operation than a "pure" bison that gains poorly, yields 50%, and comes up open every other year.

The problem is not going away.

Fact: Genes move from one species to another. Think of the Japanese and their seaweed gene. Bison and cattle live in contact with each other in modern North America. The principles of population genetics indicate that as long as

the two populations are in contact, gene flow will continue. Being a numerically smaller population (500,000 compared to over four million), bison will receive a higher percentage of introgressive

cattle genes into their gene pool.

How we as producers choose to deal with the above remains an individual decision. The authors do not condone or support increased introgression of cattle genes into any extant bison gene pool for strictly economic reasons. That's our management decision. Doing so will only diminish our current market for bison products.

At the same time--with some reservations--the authors support the preservation of the pre-contact bison genome. If you understand the focus of this article, you can figure out why.

The one thing purists should not do is attempt to impose their base-line assumptions or management model on anyone else! Any

decision regarding the management of bison remains valid until future conditions and research determine which genotypes will be ultimately fit.

The preceding is a very simplified introduction to a complex subject. We recommend the following titles. Only by understanding the basics, can we successfully argue in the upcoming purity debate.

- *Schaums Outline of Genetics*, 5th Edition. By Susan Elrod and William Stansfield. McGraw-Hill, 2010. This is as basic an introduction as you can find, good for beginners.

- *Essentials of Genetics* 5th Edition. By William S. Klug and Walter Cummings. Prentice Hall, 2005. A basic introductory text book, well written and concise.

- *Population Genetics: A Concise Guide*. By John H. Gillespe. Johns Hopkins Press, 2004. More advanced, but it will give you an in depth understanding of the principles.

- *North American Bison: Their Classification and Evolution*. By Jerry N. McDonald. University of California Press, 1981. Much of the material here is dated, however, it will give you the framework for more up-to-date internet research.

Bison Genetics - The New War Against Bison

By Kathleen O'Neal Gear and W. Michael Gear
©March 2011

In a May 21, 2010 article in the New York Times, entitled, "Deal Puts Yellowstone Bison on Ted Turner's Range," author Kirk Johnson wrote, "Most ranch-raised bison, unlike their Yellowstone cousins, carry a few cattle genes... But Yellowstone bison, marooned in the park during the decades of widespread slaughter elsewhere, are considered genetically pure." He also writes, "The 'Yellowstone 87' are a kind of Noah's ark of their kind. Genetically, these bison still carry the shaggy swagger of their Ice Age forebears that lived alongside saber-toothed cats and woolly mammoths."

The bovine DNA dilemma has been simmering, little noticed by most of us out caring for our animals, for the past ten years, but it's about to grab us by the throat and sink its teeth into our jugulars.

Here's the issue: With the advent of DNA testing it has become clear that some bison, and maybe a lot, have cattle genes. This is probably an artifact of their salvation by cattle ranchers in the nineteenth and early twenties centuries. They lived with cattle. Some of them successfully bred with cattle. So, should bison with cattle genes be eliminated from the gene pool, as is being suggested by public parks across the country, and already being implemented at some, like the Ordway Prairie herd managed by the Nature Conservancy, where "The bison with cattle mitochondrial DNA have been removed from the herd"? (See www.mnn.com/local-reports/south-dakota/nature-conservancy/studying-bison-dna and www.hcn.org/issues/321/16267). Be careful how you answer, because what's at stake is nothing less than the survival of the bison industry and even, perhaps, the genetic viability of the entire species.

First, let's look at the facts. If you go on-line to the Texas A&M web site you'll find Dr. James Derr's section on "Bison Conservation Genetics and Disease." While the entirection is interesting, the most important for us is: "An Analysis of Domestic Cattle Introgression in some important U.S. bison populations...the cold hard facts..." Dr. Derr states that after having tested 5,246 bison from 12 US federal populations, that "all appear free of cattle mtDNA except for a small number of animals (14) at the National

Bison Range." And after having tested 5,655 bison from over 100 private, State and NGO (non-government) populations, he says he found evidence of domestic cattle mtDNA "in all of these herds except for a very few." When Dr. Derr refers to "mtDNA" he's talking about a strand of DNA found outside the nucleus of the cell in the mitochondria--the little powerhouse of the cell--which is donated only by the mother. It's called mitochondrial DNA (mtDNA), and refers to bison maternal lineages. Mitochondrial DNA is different from nuclear DNA, which refers to the DNA found in the nucleus of the cell.

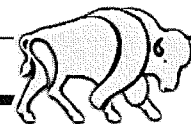
In his 2007 article in the Journal of Heredity, "A Comprehensive Evaluation of Cattle Introgression into US Federal Bison Herds," Dr. Derr says that "nuclear introgression was found in 7 (63.6%) of the examined populations." For the layperson, that means Dr. Derr found cattle genes in around 64% of US federally-managed bison herds. Currently, around 27% of the 20,000 animals in public herds have been tested, so this is a reliable estimate.

Are Derr's estimates regarding private herds as accurate? The problem is that while about 95% of all buffalo are being cared for in private herds, only about three percent has been DNA tested. And there are two kinds of DNA tests, one for mitochondrial DNA, and the other for nuclear DNA. Why is that important? Because there are only seventeen known bison mitochondrial haplotypes--maternal lineages. Anyone who has read the classic book, *The Seven Daughters of Eve*, which discusses and traces the seven maternal lineages of human beings, will realize immediately that from the perspective of mtDNA, bison have a greater genetic diversity than we do. And this is critical, especially with reference to the "Yellowstone 87." More on this later.

Before we continue, let's talk about where the "cattle genes" might come from. Is the only possibility modern ranching contamination?

The evolutionary origins of bison date to around 9 million years ago in Spain with an animal called *Parabos*. *Parabos* survived until around 1.8 million years ago. During this time, *Parabos* gave rise to the animal that is the direct ancestor of both Bison and *Bos-Proleptobos*. *Proleptobos* evolved in China approximately 4 million

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Bison Genetics - The New War Against Bison

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years ago. The bison-bos family branched from Proleptobos around 2.2 million year ago, and Bos and Bison split around 2 million years ago. From an evolutionary perspective, this is the blink of an eye. Bison and Bos are still virtually identical in their genomes. It's the differences, the polymorphisms, that create questions.

For example, what are "cattle genes?" How do we define them? Are they unquestionably *Bos taurus*, modern domesticated cattle genes? (If so, *Bos taurus* did not arrive in North America until after 1492 when Columbus brought them aboard his ships.) Is it possible that these genes are older? How much older?

The family Bos arrived in North America far earlier than Bison. *Euceratherium*, the Shrub Oxen, appeared at the beginning of the Pleistocene Ice Age, 1.8 million years ago, and was here waiting when *Bison priscus* entered Alaska during the Mindel-Riss epoch, a global warming period that lasted from 380,000 to 200,000 years ago. In addition, we know that ancient bison also lived alongside the yak (*Bos grunniens*), the Woodland Ox (*Symbos*), and several other ancient species of Bos. Both the Shrub Oxen, and the Woodland Ox went extinct approximately 10,000 years ago. The climate was rapidly changing, moving into the warming period that we live in today, the Holocene, and as the vegetation began to change there was a catastrophic decline of species. North America also lost mammoths, mastodons, camels, giant sloths, giant short-faced bears, dire wolves, and many other species. Bison, who were obviously extraordinarily adaptable, survived.

Did bison interbreed with any of the prehistoric species of Bos? Is it possible that such ancient crosses might be the source of the "cattle" genes we see today in bison? The simple truth is, no one knows. No one has done to the research to answer the question. Is it possible? Yes, it is. We know, for example, that *Bison priscus* DNA "is strictly conserved in extant yak and bison, (Pringle, Nature Precedings, Feb. 2011). But the only way to answer the question is to fully sequence the entire modern bison genome, as well as several prehistoric bison genomes, and compare them. Did these same genes exist 5,000 years ago in bison? If so, they are not "cattle" genes. They're ancient bison genes that either originate from the shared ancestry of bos-bison, or they result from the crossing of species sometime in the past. The question then becomes not "what" is pure, but rather "when" is pure?

In answer to our question, "As controls for determining that they are indeed genes from *Bos taurus*, do you utilize studies of prehistoric bison DNA from North America, or prehistoric bos DNA from North America?" Dr. Derr answered on August 25, 2010, "...we have examined genetic variation in some historical bison samples but the paper we published did not include historical samples. I have however proposed sequencing multiple bison genomes including one genome from a pre-1850 era bison."

A pre-1850 sample will be interesting, but it won't help answer the question. By that time, bison had been living beside domestic cattle for over three hundred years. Certainly some of them interbred. Why is getting an answer so critical?

An October 21, 2009, Rapid City Journal article puts the potential problems of this genetic debate into perfect perspective when it says, "The scarcity of bison without cattle ancestry leads some to argue that wild, apparently pureblood bison could qualify as an endangered species."

We hope you just dropped your cup. The Endangered Species Act clarifies that "trafficking" in endangered species is punishable by a \$50,000 fine and not less than one year in prison-per charge.

If pure bison are declared endangered, and the push is already on (see the Denver Post article, March 21, 2011 at www.denverpost.com/news/ci_17661145), there's a chance that you will no longer be able to sell such animals, or sell their offspring-if private ownership is allowed at all.

Lest you think we're being alarmist, see <http://boldventure.info/dilemma.html>, where author Jon Nichols suggests that bison with cattle genes may lose their legal status as bison and fall under the classification of domestic cattle. Nichols also suggests reclassifying American bison. "Pure" bison would be "Bison Bison Bison," (as all are categorized today), and bison with remnant bovine DNA could be renamed, "Bison Bison Americus." Creating such a division will be the first step toward establishing a legal framework for declaring "pure" bison as endangered.

Or read the High Country News article, May, 1, 2006, where Frances Backhouse writes, "The West it turns out, has almost no wild, genetically pure bison left...according to Derr's research, there are only about 6,000 pure bison in North America."

Or take a look at http://scienceblogs.com/grrlscentist/2007/01/preventing_genomic_extinction.php, where the author says, "To prevent 'genomic extinction' of bison through hybridization, biologists are focusing on the protection and perpetuation of the herds with pure or nearly pure genetics."

Genomic extinction? If you want to discuss the end of the species let's now talk about the "Yellowstone 87."

Yellowstone National Park has been testing their bison for a number of years. One of the most interesting endeavors involves the work of an outstanding graduate student, Flo Gardipee, who has been testing Yellowstone bison feces for mitochondrial DNA. She's discovered that Yellowstone has only two of the twelve known bison mitochondrial DNA haplotypes: haplotypes 6 and 8. In fact, the 2,000 bison in the Hayden Valley--roughly half of the Park's herd--have only one-haplotype 6. (www.sciencedaily.com/releases/2007/01/070128104947.htm).

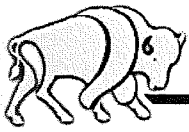
Such frighteningly low genetic diversity would terrify most of us. We'd be on the phone calling everyone we know to find animals with other haplotypes to bring into our herds to assure our animals' health and well-being. It seems to have a different affect on people who consider themselves "bison conservationists." Rather than understanding that this fact may doom the Park's herd, it makes them think Yellowstone DNA is rare beyond belief and worthy of special legal protections. Before we continue, let us clarify that many of you have at least a few animals in your herd with haplotype 6 or 8, or both. There were simply so few bison alive at the turn of the twentieth century that all twelve of the haplotypes eventually became widely distributed across the continent. So, if you're only running a mtDNA test, those animals will come out as "pure." Does it mean they are? Not necessarily. Animals with pure mtDNA, donated by the mother, may have cattle genes donated by the sire, but they will only show up in a nuclear DNA test.

Lastly, let's talk about the fundamental problems associated with testing bison DNA. So far we've assumed that the tests are accurate. Are they?

Maybe not. Before you read what follows, we need to clarify that the term "Polymorphic SNP" refers to a Single Nucleotide Polymorphism, an allelic version of a gene. Alleles whose sequence contains only a single changed nucleotide are called SNPs. The Bovine SNP50 BeadChip test is a useful tool because it cross-references bison DNA with 52,978 Single Nucleotide Polymorphisms (SNPs) from cattle.

In an article by Cino Pertoldi, et. al., published in the 2010 issue of Conservation Genetics (11:627-634), and entitled, "Genome Variability in European and American Bison detected using the BovineSNP50 BeadChip," the authors write, "No comparison of SNP variation between bison and cattle breeds has been conducted here. This is because an ascertainment bias is introduced when comparing the genetic variability in cattle and bison as the markers on the chip were selected based on polymorphisms in cattle. Hence,

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the comparison between bison and cattle should be interpreted with caution."

James Derr recognizes this problem. In his August 25, 2010 email, he wrote, "I have used the cattle derived SNP50 BeadChip with bison. I think it does provide some resolution for resolving introgression between cattle and bison and some people appear to be using the chip with success. However, this tool was developed from cattle breeds and using it in bison presents some important limitations."

Earlier in the Pertoldi, et. al., article, they say, "Inspection of the polymorphic SNPs in the bison reveals long chromosomal regions fixed for one allele and leaves little doubt that the European and American bison have extremely depauperate genomes. There are several possible reasons for the presence of such haplotype blocks such as genetic hitchhiking, variable mutation rates, and recombination, gene-flow, drift and inbreeding. It is difficult on basis of existing data to differentiate between the different possible reasons." Finally, they say, "However, it is likely that many of the shared blocks and of highly polymorphic regions are ancestral as the small N_e (number sampled) of the bison, the relatively low mutation rate of SNPs and the fact that North American bison is a relatively recent evolutionary product, coming into existence about 4,000-5,000 Y.B.P. (Wilson and Strobeck, 1999) make it unlikely that the observed polymorphisms are due to mutations that occurred in bison recently."(emphasis added.)

The authors are saying that it's impossible to determine the origins of such polymorphisms because "the markers on the chip were selected based on polymorphisms in cattle." That's what

they mean when they speak about an "ascertainment bias." The test itself is based upon and biased toward cattle genes. Why don't we have a better test? Because there is no baseline on the bison genome--it's never been completely sequenced--so they have to use the well-established genome of domestic cattle as the baseline. That's why the test is biased. Until the modern bison genome is fully sequenced, along with the genomes of several extinct bison, there is no way of knowing what are unquestionably "bison" genes, and what are domestic cattle genes.

Yet we have public parks around the country in a flurry to get rid of animals with "cattle DNA."

Any thinking person who cares about wildlife conservation and the fate of the American buffalo should be terrified by the "purity" concept. If these are ancient bison genes and wildlife managers follow this current trend, we could be losing the very genes that have allowed bison to survive to present day.

The potential holocaust of rare bison genetics is staggering.

Until there is an intensive sequencing of the bison genome that allows us to answer evolutionary questions about this issue...no one should be selecting animals based upon their "purity."

In addition to the articles referenced above, other useful references are:

McDonald, Jerry, North American Bison. Their Classification and Evolution.

Martin, Paul S., et. al., Quaternary Extinctions. A Prehistoric Revolution.

Shapiro, Beth, et. al., "Rise and Fall of the Beringian Steppe Bison," published in the journal, SCIENCE, vol. 306, November 26, 2004.

Minutes From December 13, 2010 Board of Director's Conference Call

President Bruce Anderson called the meeting to order. Present were board members John Cammack, Larry Carr, Chad Kremer, Wendy Hutchinson, Mimi Hillenbrand and executive director, Karen Conley.

The minutes of the October 18 meeting were reviewed. Hillenbrand made a motion to accept the minutes as presented. Kremer seconded the motion. Motion carried.

The financial report was presented and discussed. Hutchinson noted that she did not have the financials and asked to abstain from the vote to approve. Conley suggested waiting until everyone had a chance to review the financials and then vote to approve via email. (via email, Carr made a motion to approve the financials as presented. Kremer seconded the motion. Motion carried.)

The group discussed the recent Bison Advantage Workshop and agreed it was a successful event. Hutchinson suggested inviting all of the attendees to the DTBA Winter Conference in February. A discount package was suggested as a way to encourage these people to attend. Hutchinson made a motion to offer a package of conference attendance and one-year DTBA membership for a cost of \$115 and it would be offered to all of the non-members who attended the Bison Advantage workshop. Hillenbrand seconded the motion. Motion carried. Conley will contact the above group and send them information about the conference/membership deal.

Ideas for the upcoming Winter Conference were discussed. All agreed that a sale price presentation would be timely and very informative. President Anderson shared his thoughts on how to structure the presentation. We will try to tie in USDA meat demand/prices, specifically information on the price per pound of burger over the years; weather data and how it affects the markets; hot hanging weight price over the years and possibly how calf crop information and future calf crops play into the situation. Conley has historical sale data from Custer State Park, Kansas Buffalo Assn., North Dakota Buffalo Assn., DTBA and National Bison Association that would be a good overall representation of show results and consignment auction results. She will get the data into an excel format and send to Hutchinson who will then graph the data. Anderson will provide meat information data.

Kremer will try to get rainfall information from the park to correlate into the sale price data.

Other Winter Conference presentations will include Dr. Oedekoven, the state veterinarian, updating the group on any animal health issues over the noon hour and Conley will line up an ultrasound presentation as part of the day's activities. The annual meeting will also take place on Saturday and Dave Carter from the National Bison Association will give an NBA update. The awards banquet will take place Saturday evening and the sale on Sunday.

Conley asked about doing an informal Bison Advantage/New Producer workshop on Friday. All agreed that would be a good idea. We will keep it informal and have several producers on hand that can help answer questions and talk about the various aspects of buffalo production.

The group then discussed potential board members. Kremer will be going off the board after January and Cammack will be ending his first three-year term and is eligible to run again and has indicated he will do so. Several other names were discussed and those individuals will be contacted to see if they are interested in running for a position on the board of directors.

Chad Kremer exited the meeting at this point.

The group then discussed the Premium auction and possibly opening it up to other age groups besides calves and yearlings. It was decided to get some input from the show and sale committee and we also need to visit with the Black Hills Stock Show folks to get information on whether enough steel is available for pens before we make a decision on expanding the class offerings. Conley will check into this and get back to the group via email so a decision can be made before entry forms are sent out. (via email, Hutchinson made a motion to expand the Premium sale to include yearling bulls and two year old bred heifers. Kremer seconded the motion. Motion carried.)

Judges were discussed for the upcoming show. Several prospects were agreed upon and they will be contacted to see if they are interested in judging for the next two years.

There being no further business, Cammack made a motion to adjourn the meeting. Carr seconded the motion. Meeting adjourned.

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