## **Wyoming Outdoor Council**

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December 3, 2018

Mary Jo Rugwell State Director Bureau of Land Management 5353 Yellowstone Rd Cheyenne, WY 82009

RE: ENSURING FUNCTIONALITY OF WILDLIFE CORRIDORS BY USING THE BEST AVAILABLE SCIENCE TO IMPLEMENT SECRETARIAL ORDER 3362

Dear Ms. Rugwell:

We are writing on behalf of the Wyoming Outdoor Council to ask the BLM to analyze and apply the best available science on ungulate migrations in implementing Secretary Zinke's Secretarial Order 3362 "Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors." In February of 2018, SO 3362 directed the BLM to update all existing regulations, orders, guidance documents, policies, instructions, manuals, directives, notices, implementing actions, and any other similar actions to be consistent with the requirements in this Order" within 180 days. On September 28, 2018 the Department of the Interior issued an order directing all bureaus and offices to "base decisions on the best available science."

Secretary Zinke's order 3362 directs the federal government to work in "close partnership" with Western states to protect big game.<sup>3</sup> In response, Wyoming has developed a State Action Plan to implement the order, and the Wyoming Game and Fish Department is working with stakeholders to conserve migration corridors.<sup>4</sup> We appreciate these efforts to designate and protect vital habitat, but believe the BLM can and must do more to "enhance and improve the quality of big-game winter range and migration corridor habitat on Federal lands"<sup>5</sup> and "to conserve and protect ungulate migration corridors, stopover areas and bottlenecks so that these landscape features persist in form and function."<sup>6</sup>

<sup>&</sup>lt;sup>1</sup> Secretarial Order 3362 "Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors" at 5 (Feb. 9, 2018) [hereinafter SO3362].

<sup>&</sup>lt;sup>2</sup> Secretarial Order 3369, "Ensuring Scientific Integrity within the Department of the Interior" at 3 (Sep. 28, 2018).

<sup>&</sup>lt;sup>3</sup> SO3362 at 1.

<sup>&</sup>lt;sup>4</sup> Wyoming Action Plan for Implementation of Department of the Interior Secretarial Order 3362: "Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors" (Oct. 10, 2018) [hereinafter WY Action Plan].

<sup>&</sup>lt;sup>5</sup> SO3362 at 1.

<sup>&</sup>lt;sup>6</sup> See WGFD Ungulate Migration Corridor Strategy (February 4, 2016) at 2 [hereinafter WY Corridor Strategy]. See also Letter from Scott Smith, Deputy Director, WGFD, to Travis Bargsten, WY BLM,

Mule deer populations in Wyoming have experienced dramatic declines in recent decades due to a loss of habitat quantity and quality. In 1991, about 578,000 mule deer inhabited Wyoming. As of 2016, that number declined 31 percent to an estimated 396,000 deer. The current BLM strategy of relying on unenforceable lease notices for corridors, outdated stipulations for crucial winter range, and on stipulations designed to protect Greater sagegrouse is not working to meet the Secretarial Order's conservation goals and protect our big game. Strong stipulations specific to mule deer are needed for both corridors and crucial winter range. The good news is that the science needed to develop them is available now.

Wyoming's big game resources are a vital part of our ecology, economy, culture, and natural heritage. All stakeholders recognize the value of Wyoming's big game and understand the necessity of protecting ungulate habitat. The question is what management practices will do so most effectively. Increasingly, and appropriately, agencies' focus has turned towards preserving the "functionality" of migration corridors and crucial winter range. The Wyoming State Action Plan works to maintain that functionality, designating known corridors, identifying stopovers and bottlenecks, and calling these features "vital."

At the same time, the state has acknowledged the limitations of the current strategy saying "additional efforts focusing on conservation and land use will benefit mule deer in the future," and promising "continued coordination with the BLM, OLSI and energy developers will remain a priority to minimize disturbance in migration corridor habitats." When pressed, WGFD has called the current practice of applying unenforceable special lease notices to parcels overlapping corridors by as much as 90 percent a strategy, not a science. 12

This strategy is not holding up in the face of rapidly increasing federal oil and gas leasing across Wyoming; we need science-based management to conserve our herds. Meanwhile, studies from the University of Wyoming are quickly improving our understanding of development's impacts on migration corridor functionality. Wyoming is leading the nation in migration science and has an opportunity to lead in migration policy by developing best management practices for corridors and crucial winter range. These practices can be a model for other Western states to follow if they are thoughtfully designed to incorporate the emerging science.

As we have learned from recent research, maintaining corridor functionality is not a simple density issue. An approach based on development density, like the Density and Disturbance Calculation Tool (DDCT) developed for sage-grouse conservation, will not work for mule

June 5, 2018 (stating that WGFD's goal is "to ensure that activities occur in a manner that maintain habitat function and result in no significant declines in species distribution or abundance.")

<sup>&</sup>lt;sup>7</sup> See, e.g., Wyoming Mule Deer Initiative,

https://wgfd.wyo.gov/WGFD/media/content/PDF/Habitat/Mule%20Deer%20Initiative/Mule-Deer-Initiative.pdf [hereinafter WMI].

<sup>&</sup>lt;sup>8</sup> *Id.* at 1.

<sup>&</sup>lt;sup>9</sup> See WY Action Plan.

<sup>&</sup>lt;sup>10</sup> *Id.* at 15.

<sup>&</sup>lt;sup>11</sup> *Id.* at 19.

<sup>&</sup>lt;sup>12</sup> Angela Bruce, WGFD Habitat Protection Program Supervisor, Oral testimony at WGFC meeting in Dubois, Sep. 19, 2018.

deer. In fact, if such a tool were applied it could seriously jeopardize mule deer, especially in combination with other stipulations.

Consider a mule deer migration corridor that traverses core Greater sage-grouse habitat, a common phenomenon. The DDCT for sage-grouse establishes a project area and limits disturbance of that area to 5 percent of the total. A large project area could allow dozens of well pads and still comply with the sage-grouse EO and Wyoming Core Area Protection Strategy as long as disturbance remains under 5 percent of the total acreage and is >0.6 miles from active leks. The DDCT encourages concentrated development to reduce the amount of disturbed habitat, but we know that concentrated development has severe population level impacts on mule deer. If sage grouse policy requires concentrated development in an area traversed by mule deer corridors, and those corridors aren't protected by separate and corridor-specific stipulations, the enforceable sage grouse stipulations could force concentrated development (and attendant anthropogenic disturbance from construction, operation, and reclamation) into particularly sensitive mule deer habitat like stopovers. Other stipulations Migration corridors might remain semi-permeable, but the functionality of the corridor could be compromised.

Relying on stipulations designed for sage-grouse will not work if our goal is to conserve mule deer. Instead, land managers should apply the many lessons we have recently learned about ungulate behavior. Some of those key lessons are that mule deer: 1) do not habituate to development in the long-term; 2) will avoid well pads even when these pads are in the process of reclamation; 3) have a very high fidelity to existing migration routes and will not simply find a path around development; and 4) learn migration routes socially, which has negative implications for their resilience to human disturbance. We also know that development increases mule deer's physiological stress reaction and rate of travel through stopover areas such that migrations do not line up with plant phenology and deer cannot "surf the green wave" effectively. These lessons suggest we must reduce human disturbance in a few, narrowly defined landscape features to prevent further population level declines.

We now know that big game—particularly mule deer—are more sensitive to anthropogenic disturbance than we previously suspected, and that they have less capacity to adapt than we presumed. In the context of today's national "energy dominance" policy, climate change affecting habitat quantity and quality, and shifting land management policies, it is critical to apply these lessons so we don't push our herds past their ability to recover.

Maintaining corridor functionality is not just a matter of prohibiting impassible barriers that entirely bisect corridors. Researchers have discovered that mule deer don't adapt well even to semi-permeable barriers. This means a migration corridor can lose its functionality even if physical connectivity between seasonal habitat is maintained.

Sawyer et al.'s 2013 study examined the impact of coal-bed methane development on seasonal usage of mule deer migration corridors in South Central Wyoming. The study was designed to test whether semi-permeable barriers in a migration corridor—which may allow migrating animals to maintain connectivity with existing migration routes—exert similar effects as impermeable barriers. In the Dry Cow Creek migration route, an area experiencing concentrated development, mule deer habitat use declined by 53 percent and

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<sup>&</sup>lt;sup>13</sup> Sawyer et al, "A framework for understanding semi-permeable barrier effects on migratory ungulates," 50(1) *Journal of Applied Ecology* 68-78 (2013).

movement rates through the corridor nearly doubled. Both surface area of the corridor and use of stopover habitat decreased. In the Wild Horse migration route, where the development area was smaller and infrastructure less concentrated, and where timing stipulations restricted activity during migrations, impacts were far less severe.

The study did not provide a simple density threshold for development. Instead it raised several important issues. It demonstrated that while connectivity between seasonal range is necessary, it is not sufficient to maintain the functionality of corridors, and that development increases speed of travel through stopover areas, limiting access to ephemeral forage. The researchers cautioned that detours from the route due to disturbance also influence mule deer's ability to access forage, and that mule deer show high fidelity to migration routes, suggesting deer won't simply find new habitat outside of disturbed areas. These concerns helped form further research questions.

In 2017, Sawyer et al. published a study that analyzed 17 years of telemetry data from 187 mule deer in high-elevation sagebrush and sagebrush grassland winter range that overlaps a natural gas field in the Pinedale Anticline (the Upper Green River Basin). <sup>14</sup> This study period far exceeds the average (10 year) lifespan of a mule deer. Each year, researchers fitted new animals with GPS collars that functioned for 1-3 years. This method of data collection means that over time, researchers were studying deer born into a disturbed environment. Over the course of the study, 3.5 percent (9.5 km2) of the 264 km2 study area was converted to energy infrastructure. Deer did not show signs of habituating to energy infrastructure during this time, using habitats almost a kilometer further from well pad sites after development compared to before. Moreover, avoidance of well pads did not decrease over time. Even in the last three years of development, when most well pads were in the process of reclamation, researchers found no evidence of habituation. Instead, the population declined by 36 percent, despite on-site efforts to mitigate development impacts (including pipeline systems to reduce truck traffic and human activity and drilling of multiple wells per pad) and lowered pressure from hunters.

The study supports the conclusion that deer are generationally unable to habituate to development, even when younger generations have been exposed to energy infrastructure for their entire lives. The authors documented that indirect habitat loss—reducing the ability of mule deer to access habitat that would remain functionally available without human disturbance—can have significant population consequences. Because winter range is generally geographically restricted, deer are unable to simply expand their range. When disturbance occurs in spatially restricted habitat, population viability declines. The 17 years of data in this study, including baseline data recorded prior to the introduction of development pressure, provide a uniquely strong evidence base for explaining how, and why, mule deer avoid energy infrastructure and thereby suffer population consequences.

Recent research on social learning reinforces the finding that energy development has intergenerational impacts on big game. In 2018 Jesmer et. al. offered new evidence of social learning in migratory ungulates.<sup>15</sup> The study provides empirical evidence that learning and

 $<sup>^{14}</sup>$  Sawyer et al., "Mule deer and energy development—Long term trends of habituation and abundance," 23(11) *Global Change Biology* 4521 (2017).

<sup>&</sup>lt;sup>15</sup> Jesmer et al., "Is ungulate migration culturally transmitted? Evidence of social learning from translocated animals," 361 *Science* 1023 (2018).

cultural transmission are necessary to establish and maintain migration routes. The researchers explain the implications for conservation policy saying:

Because ungulate migrations stem from decades of social learning about spatial patterns of plant phenology, loss of migration will result in a marked decrease in the knowledge ungulates possess about how to optimally exploit their habitats. Hence, restoring migratory populations after extirpation or the removal of barriers to movement will be hindered by poor foraging efficiency, suppressed fitness, and reduced population performance. Thus, conservation of existing migration corridors, stopover sites, and seasonal ranges not only protects the landscapes that ungulates depend on; such efforts also maintain the traditional knowledge and culture that migratory animals use to bolster fitness and sustain abundant populations. <sup>16</sup>

Once migrations are disrupted, they may never be restored. It could take centuries to rebuild a migratory culture in a herd, and herds may never adapt to changing land use patterns.

In late 2018, Monteith et al. identified particular land features associated with mule deer migration. These findings highlight the importance of topographical wetness, vegetation phenology, and limiting anthropogenic disturbance in maintaining the functionality of migration corridors. The study traces a strong pattern of avoidance of human disturbance consistent across several species of temperate ungulates. Avoidance poses serious risks, because when animals avoid human disturbance, they may be displaced into habitat with delayed spring green-up, which can put herds out of sync with plant phenology. Detoured mule deer are less able to "surf the green wave" as their forage greens-up, hurting their chances of putting on enough fat to give birth to a healthy new generation. The researchers point out that the strong fidelity of mule deer to seasonal ranges and migratory routes, while maladaptive for deer, is actually an asset for land management, because we can delineate and target specific areas for conservation. The study explains:

In contrast to our prediction, avoidance of anthropogenic disturbance was evident and similar in magnitude among both movement corridors and stopovers (Fig. 3). Similarly during spring migration, mule deer migrating through natural gas fields in Colorado, USA, increased rate of movement and consequently, failed to maintain synchrony with advancing plant phenology because of delayed departure from winter range and premature arrival to summer range (Lendrum et al. 2013). With high levels of disturbance (e.g., road density 1.1 km/km2; well pad densities 1.5 km/km2), deer may detour from established routes, while increasing rate of movement and reducing use of stopovers (Sawyer et al. 2013). Avoidance of anthropogenic disturbance for both movement corridors and stopovers during migration provides further evidence of the sensitivity of mule deer to anthropogenic features on the landscape and emphasizes that such factors must be considered carefully in

<sup>&</sup>lt;sup>16</sup> *Id.* at 1025.

conservation planning because although connectivity may be maintained, functionality may be compromised."<sup>17</sup>

Once again, the study supports the conclusion that corridor functionality is not simply about maintaining connectivity between seasonal habitat or reducing development density. Anthropogenic disturbance in corridors and crucial winter range poses serious, population level risks to migratory ungulates.

Science continues to emerge from the University of Wyoming supporting the need to avoid human disturbance in mule deer migration corridors and crucial winter range. Research presented at The Wildlife Society's Annual Conference in Laramie this November reinforced this conclusion with new data.

A study by Jachowski et al. demonstrates that mule deer have a detrimental physiological reaction to human disturbance. The researchers tested stress hormone levels in migrating mule deer in the Red Desert to Hoback corridor and found that animals outside of stopovers had stress hormone levels that were 341 percent higher in areas of low landscape integrity compared to areas with high landscape integrity. Stopovers play a key role in dampening the effect of human disturbance on mule deer stress response and must be protected.

Aikens et al. used a cross-continental dataset of 1,558 GPS collared individuals across four species of ungulates to quantify how well they surfed the green wave, tracking spring green-up. The study explains that migration is a strategy used to exploit resources that are limited in time, and when resources are more time limited, more space is required for migration. It found that impediments to movement could diminish the functionality of migrations around the world.<sup>19</sup>

Another 2018 study by Wyckoff et al. examined the effects of anthropogenic disturbance (roads, well pads, and residential development) on migrating deer near Pinedale, Rawlins, and Saratoga. Unsurprisingly, the authors found that deer increased speed and reduced their time in stopovers in response to development. Deer maintained fidelity to migration routes even in the face of development pressure.

These results further indicate that development in migration corridors alters deer movement in a way that decreases the foraging benefits of migration. Deer avoided stopping over in developed portions of their routes, reducing their access to important forage. The authors conclude that long-term loss of individuals due to decreased foraging benefits may ultimately result in the loss of migration routes themselves—a trend that has

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<sup>&</sup>lt;sup>17</sup> Monteith et al., "Functional attributes of ungulate migration: landscape features facilitate movement and access to forage," *Ecological Applications* (2018), available online at https://doi.org/10.1002/eap.1803

 $<sup>^{18}</sup>$  Jachowski et al., "Integrating physiological stress into the movement ecology of migratory ungulates: a spatial analysis with mule deer,"  $\it Conservation Physiology 6 (2018)$ , available online at 10.1093/conphys/coy054

<sup>&</sup>lt;sup>19</sup> Aikens et al., "Continental-level forcing of large herbivore movements by resource phenology," Research Presented at 2018 Annual Conference of The Wildlife Society Wyoming Chapter in Laramie (Nov. 7, 2018).

been documented in other routes around the world.<sup>20</sup> These studies highlight the risk of even semi-permeable development in corridors and crucial winter range. If we push mule deer beyond their limited capacity to adapt, we may lose these corridors entirely.

The risk of losing migration corridors to development is exacerbated for mule deer because mule deer have little to no migratory plasticity when compared to other migratory ungulates. They cannot simply find another route around development. A 2018 Sawyer et al. study compares migratory plasticity (migratory animals' ability to choose whether and where to migrate) across various species. Some ungulates, like elk, are more adaptive and can change their routes and strategies. Mule deer specifically have little to no plasticity as to whether or where they migrate. This fidelity to migration routes is a maladaptive behavior in the context of development. Essentially, mule deer are caught in an evolutionary trap where they cannot adapt to the rapid changes that humans are causing to their vital habitat. Animals like mule deer that cannot adapt may experience population declines or extinction.

Together these studies have clear implications for policy: mule deer cannot adapt to development in migration corridors and crucial winter range, so we should not develop in those habitats if we want our mule deer herds to survive. In the face of 31 percent population declines and dramatic increases to oil and gas leasing throughout the state, including both federal and state leasing within corridors and crucial winter range, we must protect those specific habitats. Thankfully, vital mule deer habitat is both limited and clearly delineated, and much of it has already been identified and designated by WGFD. We already know where corridors, stopovers, bottlenecks, and crucial winter range are located. Now we need stipulations to protect them.

BLM has a strong scientific foundation to base best management practices on and should use the excellent research coming out of Wyoming to craft west-wide standard-setting migration policy. We know that anthropogenic disturbance has profound, negative impacts on mule deer at both individual and population levels. We know that mule deer have very high fidelity to migration corridors, and do not adapt well to new migration strategies, an anomaly when compared to other ungulates. We know that the geographic constraints of mule deer habitat would often prevent deer from expanding their range even if they could adapt their behavior. We know that habitat connectivity between seasonal ranges is essential, but also that mere connectivity is not enough, because semi-permeable development alters time spent at stopovers and keeps mule deer from effectively surfing the green wave. We know that migration functionality depends on ungulates surfing the green wave, accessing ephemeral forage to put on enough fat to support themselves and the next generation. We also know that migration functionality can collapse, because we have seen it happen in other parts of the world.

The time to act is now.

Secretary Zinke's order gives BLM a mandate to protect big game habitat, and Wyoming's public are strongly in favor of mule deer conservation across broad groups of stakeholders.

<sup>&</sup>lt;sup>20</sup> Wyckoff et al., "Evaluating the influence of energy and residential development on the migratory behavior of mule deer," 9(2) *Ecosphere* (2018), available online at https://doi.org/10.1002/ecs2.2113 <sup>21</sup> Sawyer et al., "Migratory plasticity is not ubiquitous among large herbivores," *Journal of Animal Ecology* (2018), available online at https://besjournals.onlinelibrary.wiley.com/doi/10.1111/1365-2656.12926

A recent statewide public opinion poll by the Ruckelshaus Institute at the University of Wyoming found that Wyoming voters are strongly in favor of wildlife conservation across political affiliation and geography with 91 percent of voters prioritizing wildlife as an important issue in electing public officials. Wyoming voters are also largely aware of migration corridors and in favor of funding their protection. Wyoming diversifies its economy, hunting and other outdoor recreation are becoming ever more important to the state economically. With hunting bringing in \$300 million to Wyoming annually, mule deer are a renewable economic resource if managed appropriately, and Wyoming citizens don't want to put that revenue at risk. By comparison, U.S. taxpayers made \$51,899 from leasing in corridors in BLM's 2018 third quarter lease sale, with parcels leasing for as little as \$2 an acre. Fewer than half of the parcels offered in corridors that quarter were even bid on. The unsold parcels may now be sold uncompetitively. In Montana, we have witnessed London based speculators paying \$1.50 an acre to develop 67,000 acres, by waiting out the clock until competitive auctions closed.

The BLM can conserve some of the last and most impressive migration routes in North America by protecting a few limited and well-defined landscape features. The sagebrush-steppe ecosystem is one of the most imperiled ecosystems on the continent, and about a third of the remaining sagebrush steppe is in Wyoming, giving the state an unparalleled opportunity to protect this habitat and the species that rely on it.

Thus far, instead of establishing the necessary policies to conserve big game and its habitat, the agency has repeatedly misstated its actions. For instance, DOI press release #921 claims that "following through on his commitment to work with states to prioritize big game migration corridors, Secretary Zinke has deferred leases and put in place innovative lease stipulations in Wyoming."<sup>26</sup> To be clear, no such stipulations exist. Unenforceable lease *notices* have been attached to parcels that overlap corridors by as much as 90 percent. These notices, as BLM's own regulations specify, have no legal effect, and disempower BLM to mitigate impacts at the APD stage.<sup>27</sup> Wyoming's citizens and our big game deserve better.

<sup>&</sup>lt;sup>22</sup> Ruckelshaus Institute of Environment and Natural Resources, "The 2018 Public Opinion Poll of Natural Resources Conservation in Wyoming," (2018) available online at

http://www.uwyo.edu/haub/ruckelshaus-institute/outreach/2018-conservation-opinion-poll.html <sup>23</sup> See generally, Southwick Associates, "Economic Contributions of Big Game Hunting in Wyoming," January 26, 2017, available online at https://www.wyoga.org/pdf/2017/southwick-study/Wyoming-Big-Game-Hunting-Economics-Southwick-Associates-Final.pdf

<sup>&</sup>lt;sup>24</sup> Data on bids for parcels in BLM's 3rd Quarter 2018 Oil and Gas Lease Sale available online at https://www.energynet.com/govt\_listing.pl?sg=4458

<sup>&</sup>lt;sup>25</sup> Kristina Barker, "Energy Speculators Jump on Chance to Lease Public Land at Bargain Rates," New York Times (Nov. 27, 2018) available online at

https://www.nytimes.com/2018/11/27/business/energy-speculators-public-land-

leases.html?action=click&module=News&pgtype=Homepage

<sup>&</sup>lt;sup>26</sup> Department of the Interior, "Just Ahead of National Hunting and Fishing Day, Secretary Zinke Announces Next Steps to Protect Big Game Migration Corridors," Sep. 21, 2018, available online at https://www.doi.gov/pressreleases/just-ahead-national-hunting-and-fishing-day-secretary-zinke-announces-next-steps

<sup>&</sup>lt;sup>27</sup> See 43 C.F.R. §3101.1-3 (stating "An information notice has no legal consequences, except to give notice of existing requirements, and may be attached to a lease by the authorized officer at the time of lease issuance to convey certain operational, procedural or administrative requirements relative to

BLM should seize this opportunity to develop best management practices in Wyoming that can serve as a model for Western states, in the spirit of Secretary Zinke's secretarial order. We have the science and the broad public support to set a new national standard for big game migration conservation. Failing to act now jeopardizes the continued existence of migration corridors and the wildlife, ecology, economy, and culture that rely on them.

We ask the BLM to defer leasing in migration corridors and crucial winter range now to give ourselves time to get our migration policy right. We cannot afford to risk the functionality of corridors because we have yet to consider the existing science. There are considerable parcels in the upcoming supplemental February 2019 lease sale and the March 2019 first quarter sale. Second, the BLM should incorporate the best available science into stipulations to ensure corridor functionality. These must be legally binding stipulations rather than unenforceable lease notices. Third, the BLM should issue a statewide amendment to all RMPs incorporating the new stipulations. Last, the BLM and WGFD should establish an MOU to clarify how the stipulations would be applied at the drilling, production and reclamation stages.

Thank you for your consideration. We look forward to hearing from you soon.

Sincerely,

John Rader Attorney/Conservation Advocate Wyoming Outdoor Council

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High Plains District Manager Valori (Lori) Armstrong (acting)

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Kemmer Field Manager William (Aaron) Mier

Pinedale Field Manager Caleb Hiner

lease management within the terms and conditions of the standard lease form. Information notices shall not be a basis for denial of lease operations.").

Rock Springs Field Manager Kimberlee Foster
Rawlins Field Manager Dennis Carpenter
Buffalo Field Manager Chris Durham
Casper Field Manager Lonny Bagley
Newcastle Field Manager Rick Miller
Cody Field Manager R. Cade Powell
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