

New Mexico Wounds: Natural Processes, Biota, Cultural

Natural Processes: 400+ yrs. ago

Impacts/Losses: over past 400 years

1. Hydrologic Cycles, Connected Floodplains
Watershed storage

1. Dams, Disconnected Floodplains,
Road building, Pollution

2. Fire Cycles, Forest and Grassland adapted

2. Fire suppression/Catastrophic Fires

3. Grazing by native ungulates (Bison, Elk, Deer, Pronghorn)
& lagomorphs (Pika, Jack, Cottontail rabbit)
& rodents (Beaver, Muskrat, Packrat, Mice)

3. Grazing by non-native ungulates
(Cows, Horses, Sheep, Goats, Pigs)

4. Trophic Levels, Predators (Wolf, Grizzly, Jaguar)

4. Extermination/Extirpation, broad-scale poisons

5. Nutrient Cycles: Nitrogen, Phosphorus, Salts

5. Disrupted, altered, unbalanced, fertilizers

6. Succession of Community Types

6. Interfered with or accelerated on broad scale

7. Landslides, Erosion, Deposition
(Floodplains, alluvial fans, lava flows)

7. Paved/Cemented structures, downcutting

8. Wind storms, clean fresh air, wind flow patterns,
soundscapes, cloud formation

8. Wind turbines kill 1,000's of birds/year
sound pollution, cloud pattern disruption

9. Solar radiation, moderated by atmosphere,
plants/animals adapted to historic levels over time

9. Increased UV levels, atmospheric pollution,
trapped IR radiation, sudden changes

10. Climactic Stability/Cycles buffered by natural
processes above ^

10. Climactic sudden change, disruption; CO2,
methane, other hydrocarbons into air, +mercury

Biotic Communities:

Impacts:

1. Insects/Pollinators, Disease balance, parasite diversity
(Bees, Bats, Butterflies)

1. Loss of pollinators, pesticides

2. Native Plants, diversity, balance, no exotics
adapted to natural processes above, + native animals

2. Loss of native plants, introduced species, roads,
logging, mining, invasives, agri-business

3. Native Animals, diversity, balance, no exotics,
adapted to natural processes and plants above.

3. Loss of native animals, introduced species, hunting,
trapping, roads, diseases, depredation, poisons
surface water loss & impacts to natural processes.

4. Native Peoples, culture of respect for nature,
adapted to all of above.

4. Loss of native peoples, culture. Introduction of culture
of money, ego, dominion over nature. Diseases, slavery

Restoration and Renewal

- To what extent...what time... and what place are we restoring the land? and...
- For whom are we doing it?

Homo nativa? or Homo industris?

When monitoring any site in NM, its important to remember **the context in which we're in now** by recalling the losses, the "ecological wounds" that have occurred, and those that might not be healed in our lifetimes, or maybe not ever.

Besides individual species of plants, animals, insects and other biota that have gone extinct or have been extirpated or have been significantly reduced in numbers, there are the natural processes that have also been disturbed, disrupted, broken, suppressed, polluted, etc. to varying degrees.

So in monitoring, we're often recording what is currently observable, but to have in mind what is missing and may never have a possibility of returning, especially when monitoring a restoration project, is useful for several reasons.

One reason to know the ecological history and restoration potential is simply to not have expectation(s) that are not likely to be fulfilled.

All eco-regions in NM have been heavily impacted by long-term mining and logging operations and extensive grazing - by sheep, cattle, and goats. Also include road and highway fragmentation, extermination of predators by shooting, trapping and use of wide-spectrum poisons, air pollution -including mercury transport to most surface water bodies, other water quality factors such as Giardia, loss of springs and other surface water flows, and widespread poaching and vehicle trespass into closed areas and you can see that all lands in NM have been impacted somehow. Many of these widespread and heavy impacts are still either actively happening today, or their historical effects are still present and have not been mitigated, restored, or otherwise addressed in a restorative way.

Being aware of as many of these impacts to species numbers and natural processes (as well as non-native species which may be invasive, and even native species which have become invasive from an ecosystem whose natural system of checks and balances has been disrupted or is in a state of disequilibrium) again is important for another reason, and that is not to be fooled by a "pristine area that has never been touched", or "ungrazed for 100 yrs.", because all areas are connected, and unfortunately, the areas that have been heavily impacted far out measure the "pristine" ones. The land in and around our restoration sites or monitoring areas are far more important, and have many more impacts to our sites than we may think.

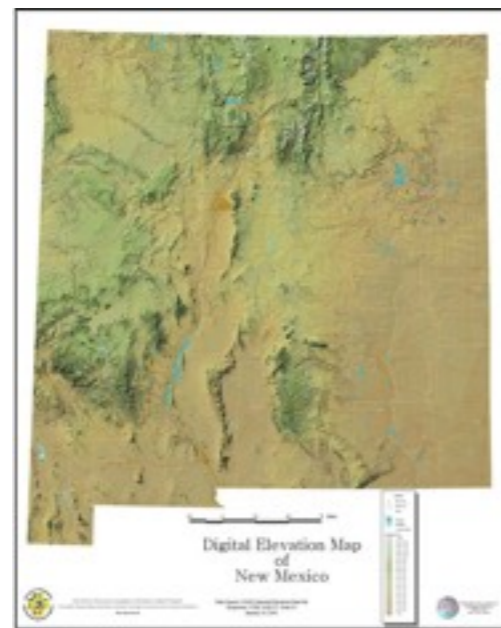
The fact that the Bison, the Prairie Dog, the Sage Grouse and the Black-footed Ferret are effectively gone, and the short-grass prairie is fragmented and replaced with industrial agriculture and ranching, highways and oil/gas pipes and pads, polluted above and below.

The fact that the Grizzly Bear and the Timber Wolf and Jaguar are gone, the fact that Oryx are here to stay and feral hogs are making incursions from Texas, the fact that Pronghorn and Mule Deer are greatly reduced in number, along with Desert and Big Horn Sheep, most native fish, amphibians, crustaceans and mollusks. The fact that sagebrush has replaced grassland in the

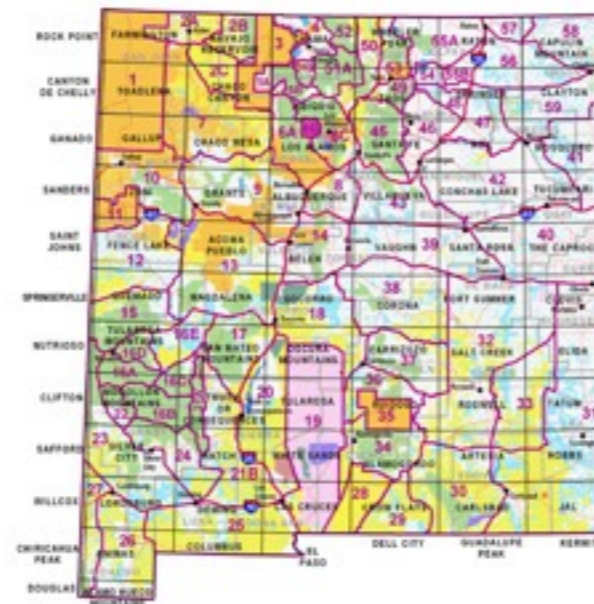
Colorado Plateau, the fact that creosote brush has replaced the Black Gramma grasslands of the Chihuahuan desert, and the fact that Ponderosa Pine probably won't return to the Jemez Mts., and certainly not as old growth climax forest like it was 150 yrs. ago.

These are big facts - large impacts on a state or region-wide scale and there are many more of them that we can name, but the impacts of all of them together we may not ever know, or ever get around to dealing with, measuring, or understanding. How could we when we didn't study, know, measure, name or understand all the biota and their interactions before wiping them out? We have altered the geologic time scale, impacted the geology, the rock strata of the Earth. No humans have done that before, its quite an accomplishment.

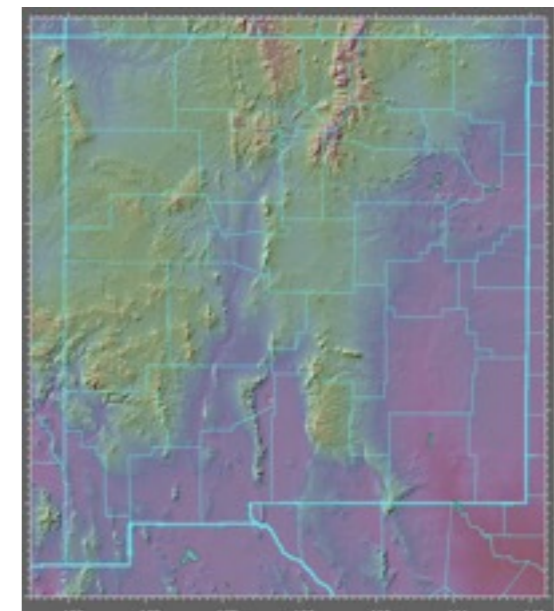
So even if we can't possibly know, name or understand all the lost biota, disturbed natural processes and their missing interactions, we can know, name and understand some of it, and this what I feel is important as we go forward in any restoration and/or monitoring effort around the state. Its important to know what's missing, and to be open to always seeing more of what's missing, so that our restoration and monitoring efforts from the baseline to the finish line are ever more deeply seen in the context of what was, what will never be again, and what may still be possible.



Past...



Present *



Future?

What we had, whole cloth:

Free flowing rivers, Wetlands, Springs, Bosques, Cienegas, Creeks, Floods, Snow melt, Monsoons, Watersheds as reservoirs, Beavers and their dams/ponds, Fish, Mollusks, Crustaceans, Otters, Geese, Cranes, Ducks, Bats, Raptors.

No roads, wheels or beasts of burden, all carried on people's backs. No domestic animals, and gardens were planted by hand, simple agriculture. Human labor organized by tribal culture and Hispanic land grant culture: Restrictions on human development.

Wildfires burn regularly, creating a mosaic of burned and unburned areas over time. This creates a mixed age vegetation, fire adapted, resilient.

Soil remains friable, covered with vegetation with a stable living soil fungal/bacterial life balance.

Diversity in herbivory in multiple trophic levels with a diversity of predators in each level to keep herbivores moving, alert and healthy. Herbivory mainly checked by drought and fire, not hunting/predation.

What we had:

Loss of native and land based culture based on respect. Human ownership/uses are limited. Even small scale ranching/leasing of "pasture" becomes non-viable, cattlemen fight for their "way of life" and "their land". ESA is the only gain in land/species protection hedge against ownership, but nothing as powerful as oil powered industrial/legal ownership/uses, access has been gained by native species.

What we replaced it with, suits and ties:

Acequias and diversions, draining wetlands, roads capturing creeks, downcutting/disconnection of stream beds from floodplains. Extermination of Beaver, damming large rivers, Evaporation from open water in reservoirs, and even springs as Bosque and vegetation is cleared. Construction of levees.

Human diseases brought with domestic animals, roads made with cattle, sheep and horses + carts and wagons. Agriculture spreads from horsepower to mechanized Agri-business, starts pumping groundwater, but is still limited by drought, insects, diseases, money and human labor.

Wildfires are suppressed, so they become bigger, creating even aged stands, sterilized soil, and catastrophic erosion.

Soil compaction from unrestricted herbivory results in soil death, dewatering, loss of soil fungal/bacterial balance, loss of soil moisture holding capacity, favoring deep rooted shrubs and unpalatable asteraceae/brush and junipers.

Simplification of herbivory and removal of native animals and people from the land. Removal of predators/broad-scale poisoning of all levels and birds. Herbivory stagnates, removal of fire disrupts renewal cycle. Herbivory left unchecked in summer. Grazing pressure selects for Blue Grama and

What we gained/lost, suits and ties:

Incredible gains in free land, cattle wealth, mineral and timber wealth, but all that boom has gone bust, loss of soil/grass productivity, loss of surface water, compaction/salinization of soil, mined out, logged out, loss of industry, even though it was all converted to industrial scale production. Romance of the cowboy and Indian remain. Now production is tied to alfalfa and grain feed stock, but industry is still tied to the land with access rights for grazing, mining and logging. CAFO's and Dairies, Oil and Gas development, surface 'access' roads, pipes and pits. Military fencing, bombing, aircraft, roads, etc.

Now