Eden Shale Land and Water Use Planning Map

A Cow-Calf Beef Operation

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Planning an efficient agricultural operation is best accomplished by creating land-use maps of the property. Maps can assist with determining and planning the optimum layout for roads, fences, gates, waterers, and field rotations. They also aid in identifying productive soils and sensitive areas, like sinkholes and drainages. On a livestock operation, roads can act as lanes for moving cattle. They also make an excellent location for installing efficient practices such as gateways, waterers, fence-line feeders, and styles.

Layouts can be created to show the relationship between the farm fields to the farmstead and highways. Layouts can also be created to show the relationship of farm buildings to each other, as well as to the fields, gates, and everything else that affects efficiency and profitability. The farm map provided shows the relationship of installed practices to fields, roads, and streams. Layouts should also be created to show the internal and external layout of buildings that can aid in production by facilitating flow, reducing chore time, and increasing the overall efficiency of the operation.

Proper design of facilities can reduce the drudgery of farming for producers and their livestock. The goal of proper layout is to create optimization and efficiencies that reduce inputs needed to produce cattle, while at the same time increase cattle productivity. The end result is higher profits for beef operations. There are numerous systems implemented at the Eden Shale Farm to increase productivity and profit. This map is the best way to show the location of these practices and how they create an integrated system.

Benefits of Land-Use Planning

The output for a beef cattle operation is dependent on forages, availability of water, and climate. Cattle production requires an infrastructure of water resources to facilitate rotational grazing. The infiltration of water into the soil profile is necessary for forage production. Air quality for cattle is influenced by humidity, temperature, wind, and pollutants. Buildings, shade structures, trees, and topography can positively influence air quality and cattle production. Therefore, production relies on the natural resources of soil, water, and air to produce a high quality and quantity of forages.

Not all farms are the same. The modification of soil, water, and air is needed to make conditions more suitable and efficient for cattle production. In many cases, conditions have to be improved on a farm by farm basis through land and water use planning. Many of the locations identified, on this map, are site specific locations where soil, water, and air characteristics have been improved through the implementation of conservation practices. These practices were implemented to achieve their direct benefit. For instance, practices such as stockpiling and applying manure and bedding to hayfields to increase soil organic matter, thereby improving soil heath, fertility, and water holding capacity. Water flow from impervious areas, like a roof, was improved so that barns were not islands in a sea of mud. Once the water was diverted it was then collected to provide drinking water for cattle requirements. As with all conservation practices, they provide indirect benefits, which may reduce time, wear and tear on equipment, forage waste, mud, and input costs. In addition, conservation practices can provide the following benefits:

- Higher income.
- Higher return per hour of labor.
- Decreased machinery operating cost.
- Increased livestock feed efficiency.
- Creates a better working environment for producers and cattle.
- Improved morale and worker satisfaction.

Land–Use Planning Factors

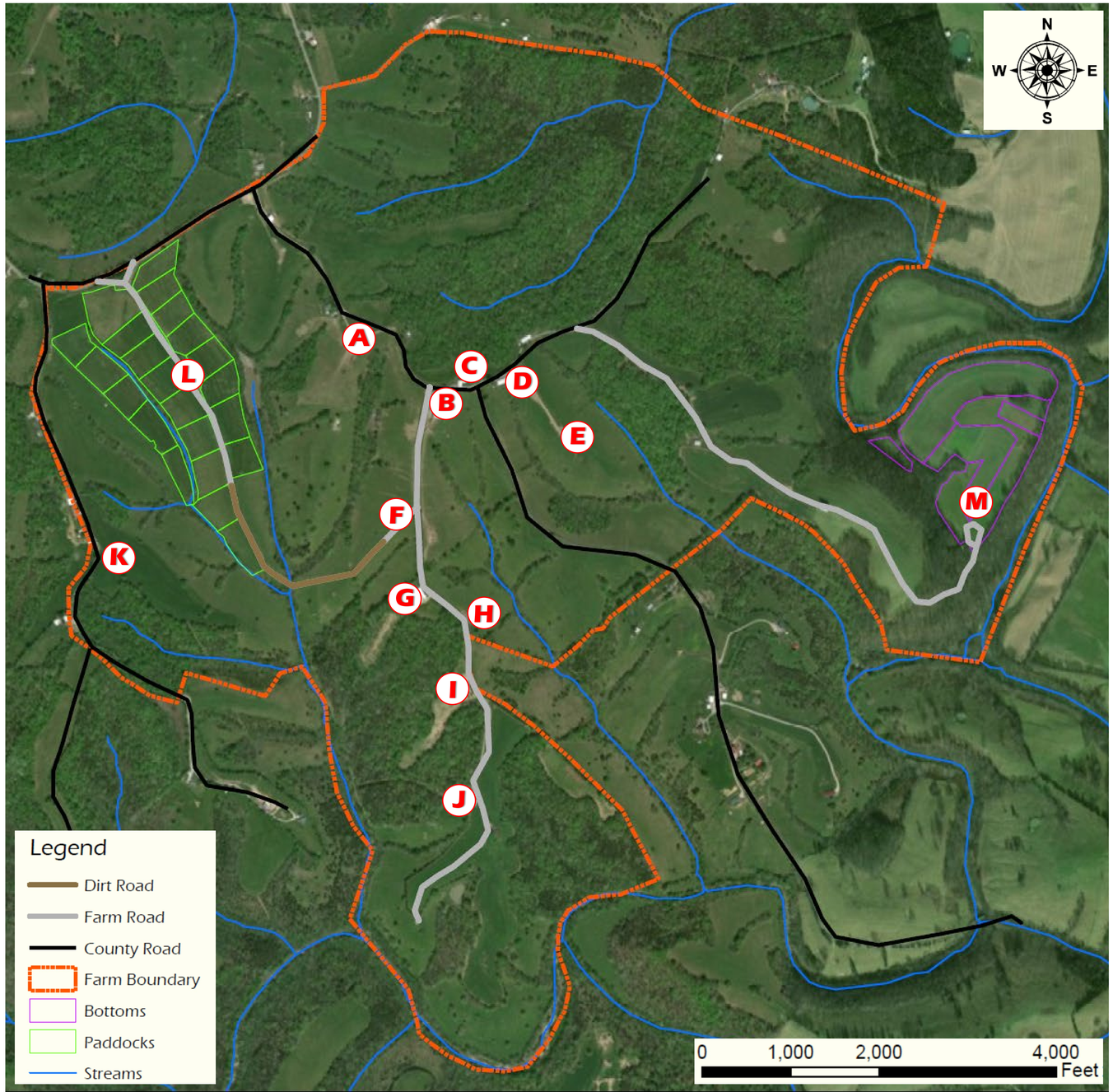
- Access, Location, Shape, Dimensions.
- Prevailing wind.
- Orientation of buildings and slopes.
- Drainage around structures and of the topography.
- Improving soil structure and health by controlling mud, managing manure, and implementation of buffers and filter strips.
- Improving the quality of soil, water, and air with low impact development.

Access and Location

- The ideal location for a farmstead is the center of the farm. Topography is the most limiting factor of this option. The next best option for a farmstead is the center of the operation along the highway.
- Facility and field access and location are critical for reducing time, labor, fuel, drudgery, etc.
- Highways, farm roads, and lanes should create access to fields, waterers, facilities, feeding areas, markets, etc.
- Lanes and farm roads that provide access to the farm are ideal for planned conservation practices such as centralized feeding areas, waterers, fenceline feeders, etc.

Shape and Dimensions

- The shapes and dimensions of barns, fields, waterers, etc. play a critical role in livestock production, harvesting, and economy of labor and materials.
- The goal is to minimize travel distances of the commodities that need to be moved by the producer. It is also extremely important to consider livestock by reducing travel distances, providing materials and requirements to them in an efficient manner. Dimensions such as the height of forages, depth of soil, and distance, height and shape of waterers plays a critical role in production.
- Livestock need space to eat, drink, and lay. Water is the most essential nutrient. Watering stations are located and designed to provide water access to cattle, as well as room to drink, and to meet water intake requirements. They are designed to serve multiple pastures, to facilitate rotational grazing, and reduce erosion, while providing indirect benefits.



A Cow Barn
B Bull Barn
C Field Day Barn
D Heifer Barn
E Four-Way Waterer
F Five-Way Waterer
G Hoop Barns
H Fenceline Feeders
I Large Bale Feeder
J Fencing Barn
K Cistern Barn
L Paddocks
M Bottoms

Farm Management

- The perfection of the art of farm management consists not only of doing everything well, individually, but also creating a systematic arrangement of all the parts, so that everything shall be done, not only in the best manner and at the right time, but with the most effective and economical use of labor and money.
- Creating a systematic arrangement requires planning and designing. In a formal sense, the task falls upon engineers and architects to determine machinery and equipment, develop blueprints, create operation and maintenance manuals, etc.
- As a producer, one way to describe and create an efficient livestock operation is to develop a land and water use map. The information to include on maps would include any factor that affects the profitability of the operation and has the potential to impact natural resources.

Farm Layout

- The layout is the relation of the fields, gates, lanes, waterers, roads, etc. to the buildings, and the buildings to each other. The layout also considers economy in fencing, for convenience of access of producer and livestock, and for a full command of pasture and operations at all times.
- Farm layout is often given too little or no consideration, which usually results in an arrangement that is neither simplistic nor systematic for labor efficiency or livestock production.

Buildings

- Farm tractors and implements have evolved separately from farm buildings. In many cases, buildings are nothing more than shelters from weather, as opposed to structures that contribute to production using a functional design. At Eden Shale, we are striving to create functional structures by implementing practices, in and around buildings, that simplify work, increase productivity, decrease mortalities, reduce material handling and inputs, and improve livestock health and production.
- Buildings and structures can be an aid to production or a liability. Improper buildings represent large, misdirected investments. A desirable internal and external layout is necessary in order to economize labor and enhance the value of the property.