
DEVELOPERS ADDRESS NEW CHALLENGES IN THE PLANNING AND IMPLEMENTATION OF VERY LARGE SCALE DEVELOPMENTS DESIGNED AS SELF-SUSTAINING COMMUNITIES

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“Attitudes toward the land must ultimately be based on attitudes toward life.”

— Clarence Glacken

“The map is never the territory”

— Gregory Bateson

INTRODUCTION

This article is focused upon the learning and innovation that grow from the experience of pioneering the implementation of a large-scale (19,500 units) self-sustaining community plan on a large acreage ownership. Across the suburban and rural areas of the United States and especially in South Florida old family farmlands and ranches are passing from the generations who assembled and worked them to heirs who would prefer to sell the property for development. Kitson & Partners (K&P) was able to secure such a family ranch, the Babcock “Crescent B” Ranch, when attempts by the public and the State of Florida to purchase it were unsuccessful. The precedent K&P has set is to assure that approximately 90% of the 91,361 acres they purchased from the Babcock Family will be in various forms of public ownership at the end of the project. The purchase and subsequent below market price sale of the 73,471 acres to the State established Florida’s largest State Preserve, working ranch, single purchase, and public access to lakes and greenways. This was a formidable accomplishment and sets a new precedent and model for land management and conservation.

The purchase of the Babcock Ranch completed a publicly owned or leased wildlife corridor that stretches from Lake Okeechobee westward to Charlotte Harbor and the Gulf of Mexico. This corridor extends more than halfway across the state.

EXTERNAL ISSUES

- Very Large Scale – 92,000 acres
- Very Large budgets – billions
- Very complex context – federal, several state agencies and multi-county jurisdictions
- Very Long timelines – 20–30 years to buildout
- High expectations or doubt in the community of the sincerity of the project’s intentions
- High levels of public uncertainty that the Developer’s plan and commitments can be sustained over 20 years
- High Expectation that long-term (5–20 yrs into the future) development site impacts on hydrology, ecological systems, listed species,

traffic/roads, energy should be scientifically documented in the earliest stages of planning as opposed to doing so prior to each construction phase of development increments (over the 20+ years of development activity)

- Perception of very deep pockets that can finance all community and regulatory agency expectations (including some that predate the development proposal)

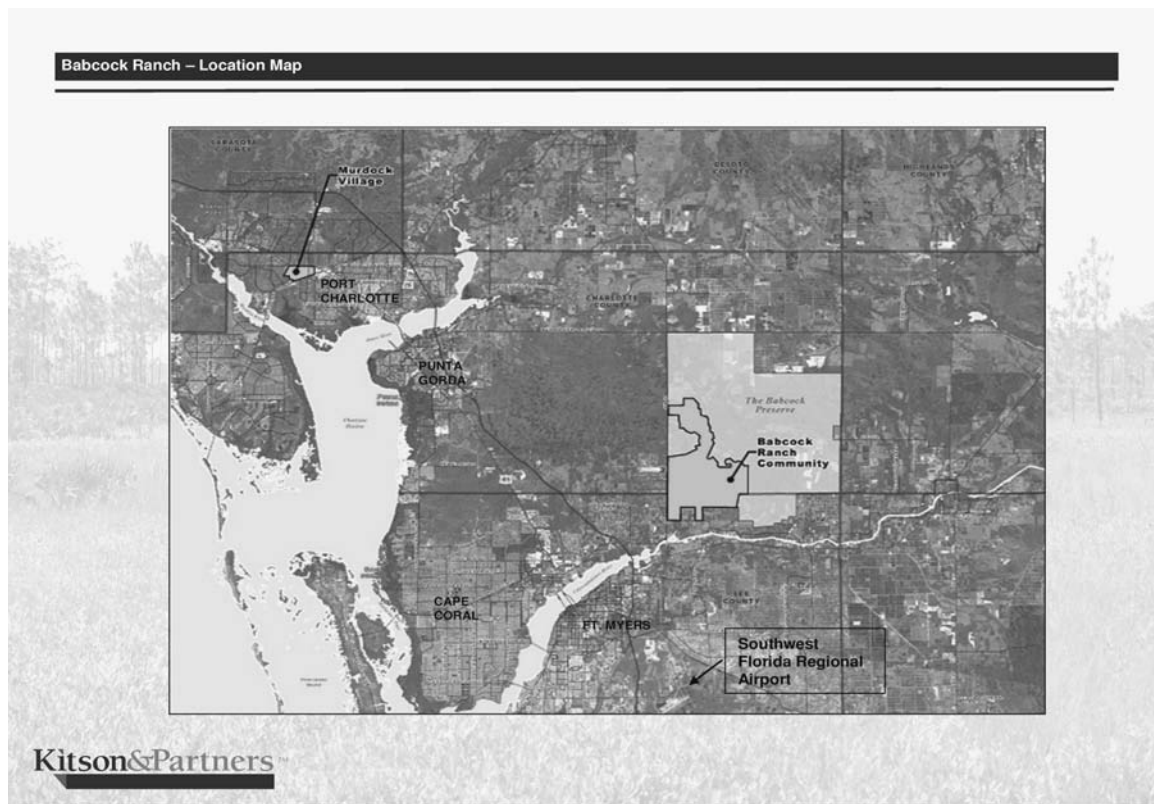
INTERNAL ISSUES

- Knowledge, understanding, and collaborative team skills necessary to integrated planning and design of a self-sustaining community

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FIGURE1. The Babcock Crescent “B” Ranch is located in Charlotte and Lee Counties in Southwest Florida.

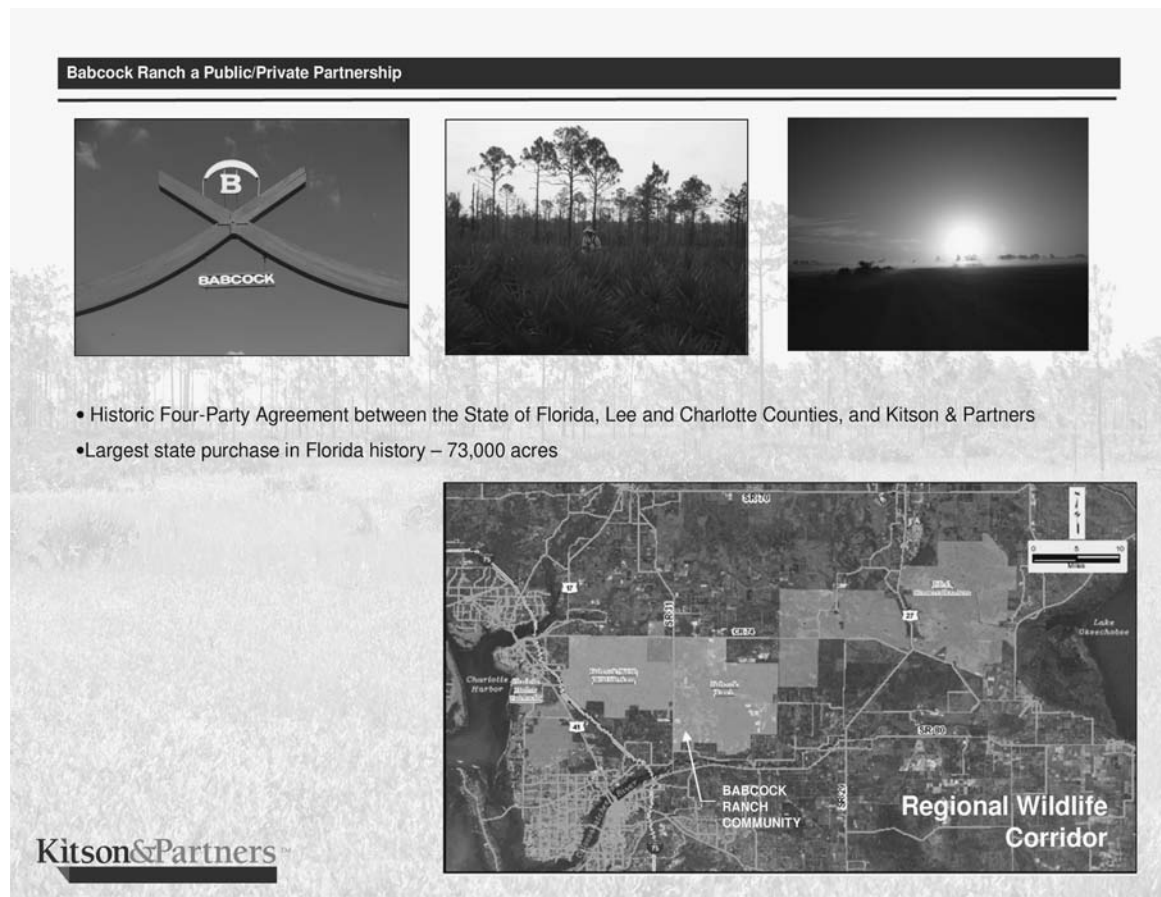


- Management of complex and new projects that contain new uncertainties and risks
- Providing science based ecological and hydrological data early in the project to delineate considerations for the development planning and permitting
- Developing integrated specific planning benchmarks that frame planning and permitting elements as a seamless process linked to a schedule and business plan
- Receptivity and willingness of existing professional and support staff to embrace new principles
- “Start-up” mentality frustrating to some veteran and seasoned professionals
- Rapid growth in staff, space, program orientation, and support requirements
- Linear planning traditions are challenged by collaborative integrated planning processes and principles

- Stable leadership with vision, team nurturing, management, communications, and team building skills

It is a challenge for any business in the development industry attempting to plan and implement a major subdivision or entire new community in the context of today’s regulatory system. It is a far greater challenge if the Community Master Plan encompassing 17,890 acres (carved out of a 93,000+/- acre ownership) is on the growing edge of new and innovative practices. Those “green” and sustainability focused practices are anchored in sound ecological and hydrological planning applications and embrace new technologies, new computer modeling initiatives applied to traffic, water resources, financial projections, new thinking in community design initiatives, and financing of a self-sustaining, “green” community plan. Most of these plans and practices exceed current standards or propose new and “non-standard” alternatives

FIGURE 2. The challenges to planning and implementation of a large-scale, self-sustaining community plan are rooted in both external and internal factors.



to many of the local, regional, state, and even federal regulations, codes, and standard practice.

David Eisenberg makes the case that, “Nobody intends to give a pass to the worst builder and to beat senseless the best one, that’s what our system does.”(Eisenberg p.10). Eisenberg’s perspective on myopic local building codes translates to equal application in the permitting and regulatory arena at all levels of government. These regulatory protections are justified under the U.S. Constitutional provision for protection of the general health, welfare, and safety of the public. Just as this provision is used to justify speed limits on roads, it is used to protect people in buildings from fire and structural failure: to provide a means of egress, light, ventilation, heating/cooling, water, sanitation, electrical power, gas (if applicable),

and even safe landscaping and flood protection to fulfill this obligation of government.

In Florida, many of the building code standards were upgraded to more stringent standards for better protection after Hurricanes Donna (1960) and Andrew (1992) as earlier codes were seen as having serious shortcomings. Standards and rules tend to evolve toward greater complexity and higher degrees of “protection” but sometimes tend to lose focus on the original intent. Code provisions are added over time to correct and not repeat past mistakes; they are not prescriptive to assure the conditions that are desired.

Eisenberg describes the current condition as,

Any builder or developer who would propose to change to different structural criteria, waste

management, ventilation, heating or cooling or other mechanical systems not using on the grid services is required to provide absolute proof that it will work—not just that it will be safe, but that it will perform to quite narrow and unnatural comfort parameters. You are also required to add backup mechanical systems to ensure that you can maintain those comfort levels. Yet the code has no problem with homes that flaunt passive-solar design principles, that have inoperable windows and rooms without natural light or ventilation, and that require massive mechanical life-support systems to maintain minimum utility, making houses dangerous or possibly lethal when they lose their external power supply.

(Eisenberg P. 12)

Eisenberg notes the typical regulatory review system does not require any natural backup when these energy-consuming systems lose external power and have great potential for jeopardizing air quality, heating, cooling, ventilation, and light for the occupants. In the case of a large-scale developer, the South Florida Water Management District (SFWMD) wants proof and assurances at the conceptual level of permitting that water budgets, water quality designs and practices, wildlife management practices and structures, traffic water related improvements, and that waste management systems will work when built. In the past, this level of detailed assurance has not been required until much later in the process (when application for construction permits were made). The possibility of administrative challenge for such a large, high profile project tends to make regulatory agencies very cautious and politically sensitive to cover themselves that they have done everything possible to protect the public interests. On the positive side the staff of the SFWMD has been open to the use of robust science-based modeling protocols that use the best available data to determine runoff rates. The result is the developer is asked to provide assurances much greater than required of other smaller development applicants who are less visible.

This was the case when K&P had considerably exceeded what all other regionally adjacent applicants, including government entities, had provided on even

moderately large-scale projects, or that government had assessed on the cumulative impacts of all the previously built smaller scale projects. This phenomenon is applied to road impacts, water management, listed species, wetland protection, and mitigation. Typically, all of the surrounding development in total acreage and cumulative development impacts is far greater than that of the single large-scale applicant. Local governments tend to look to the large-scale developer to make up for the costs of accumulated impacts by requests or demands to fund not only the reasonable impacts of their development but also the backlog or shortfall left from the small scale projects not paying for their full impacts. Thus, the large-scale developer takes much longer to negotiate through the regulatory processes and procedures, even when they substantially exceed the existing regulations, rules, codes, and standard practice. Local governments tend to feel they can stall zoning and building changes as leverage to maximize their requests or demands of funding from the developer.

Every developer knows that time spent in securing entitlements and permitting is very expensive and increases carrying costs. The expenditure of the dollars spent waiting and negotiating in the regulatory review process tends to dampen the ability and eagerness to invest in more comprehensive ecological, hydrological, alternative energy, transportation or social design studies, research, and resource protection. It can also affect the ability to build more affordable housing in the community.

OVERVIEW: THE BABCOCK RANCH – KITSON & PARTNERS

The Babcock Ranch was purchased by the Babcock family in 1914 and it was called the Crescent Ranch B. It was purchased for its timber and was part of more than 156,000 acres the Babcocks owned in Southwest Florida. Over the years, the Babcock family sold or donated to the state all but 92,000 acres of the original ranch holdings. In the 1930's Fred C. Babcock, the founder's son, assumed responsibility for ranch management. Like his father, Edward Vose Babcock Sr., Fred was an advocate for preserving natural lands. As an avid hunter, he managed the lands with sustainable practices and managed the ranch businesses, establishing timber harvest, cattle opera-

tions, farming and alligator ranching. He used control burning practices, removed exotics, and valued the beauty of the ranch. The Babcock Ranch was not managed in square blocks as is typical in Southwest Florida. Mr. Babcock created lots of edge communities and ecotones ideal for wildlife and free ranging cattle.

When Fred Babcock died in 1997 the family decided to create a development on 20,000 acres of the Ranch that would accommodate 50,000 residents with major commercial enterprises, including big box stores on the western boundary along state highway 31. The development concept met with strong local opposition but crystallized the effort that had been afoot for public purchase of the ranch. After almost four years of working toward that end, the complexity of the transaction was overwhelming even when state funding for the purchase price was attained. This dilemma was due to tax issues and Florida's constitutional prohibition on the state owning a for-profit corporation (more than 100 lawyers could not find a satisfactory solution). The family decided it must sell to a developer who could address the complex tax issues and purchase of the family "C" Corporation liabilities as well as the land.

The acquisition of the 91,361 acre Babcock Ranch by K&P, securing one of the largest ranch holdings east of the Mississippi River, was a remarkable feat. It was both the largest single purchase and the most complex real estate transaction in the history of Florida. The purchase of the Babcock Ranch filled the remaining gap in establishing a wildlife corridor from Lake Okeechobee west to the Gulf of Mexico that stretches more than 60 miles by about 2 to 14 miles wide. The K&P purchase occurred after almost five years of public attempts to purchase the ranch had failed. Many development interests from all over the world made purchase offers but the family accepted the proposal of K&P as it provided a means to preserve 73,000 acres and assured a Babcock Family Legacy when the State purchased the least impacted area of the Ranch from K&P as a State Preserve. The Babcock Ranch Preserve will remain as a working Ranch with row crop farming, cattle operations, upland timber harvesting, ecotourism, and other smaller businesses like alligator ranching, to generate income for its support.

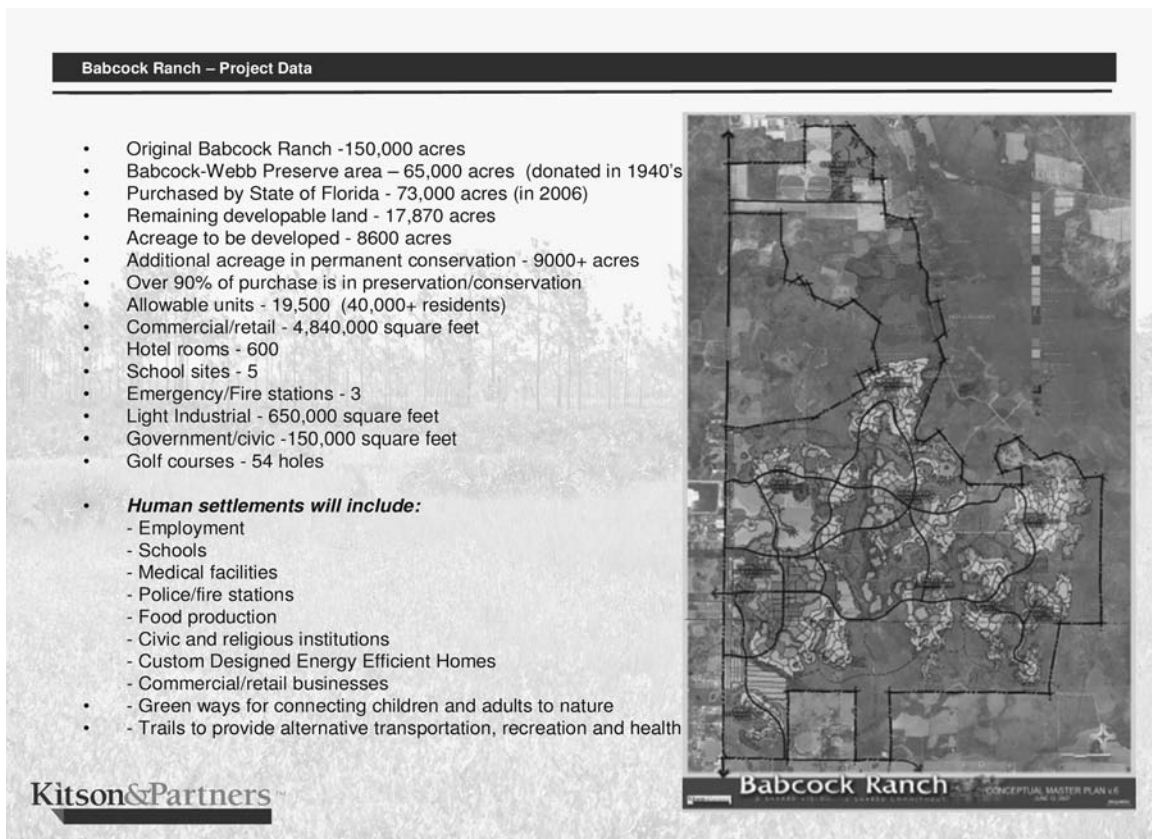
THE BABCOCK RANCH COMMUNITY

The Babcock Ranch Community is committed to becoming one of the nation's leading self-sustaining green communities. It has created an organic design which includes a town center, village center, three smaller villages, four hamlets, and six million square feet of commercial and retail space each surrounded by greenway corridors. The development will accommodate approximately 19,500 building units on approximately 8,600 +/- acres of the 17,890 acres designated as the Babcock Community development area (Fig. 3A). The plan places more than 90% of the development on existing rock mines, farm fields, and pastures. It protects the natural flow ways and creeks with greenways that provide buffers. The existing drainage ditches are being restored to more stream-like conditions or backfilled. The greenways also serve as north and south and east and west wildlife corridors and venues for passive recreation uses and as an alternative transportation system for walkers, bikers, rollerbladers, electric carts, and equestrian uses on more than 42 miles of the trail system. The greenways are designed to be integral elements within the development pods to provide green views, and water and wildlife management corridors. As greenways extend into the heart of the development pods, they give transition into park-like landscape features.

Native plant landscaping will be implemented in all public areas with a strong mandate for the use of native plantings on private property. One of Florida's largest native plant nursery operations (Crescent B Ecosystems) is being established and will utilize seed stock gathered on the ranch to re-vegetate the development and for restoration projects. It will provide a resident native landscaping education program and a local retail nursery where homeowners can purchase landscaping materials. A certified organic community supported agriculture program (CSA) will be a part of the community. Local food production from both the organic farm and the ranch beef stock provide food safety for residents while community gardens provide the more urban residents with an opportunity to garden for therapy, recreation, and socialization.

A dark skies plan guided by the principles of the International Dark-Sky Association (IDA) will be established throughout the community. Due to light pollution from the International Airport, Florida

FIGURE 3A.

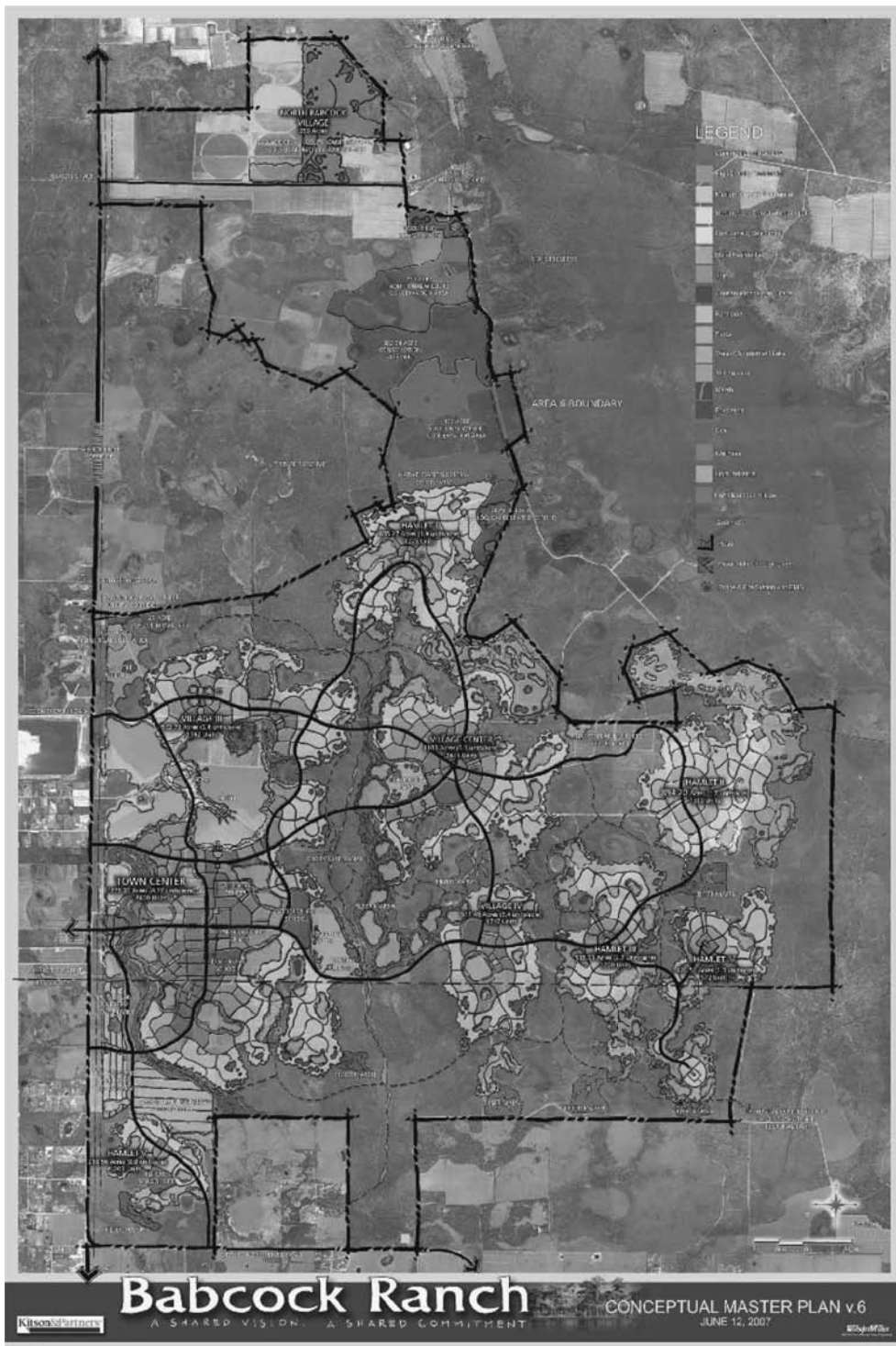


Gulf Coast University anticipates moving its large telescope into a new observatory within the community and then linking it back to the university via Internet connection. Other planned amenities include equestrian centers, “green” preschool day care, senior integrated centers, and eight green (LEED) standards designed schools and commercial buildings: medical facilities, regional and community parks, and arts complexes. Community elements include a birthing center at the medical center, cemetery, and two Memorial Reflections Trails that tend to ground residents in the realization that this is a community you can be born in, live your life in, and get recycled in. These types of community components create a sense of place connection in residents.

Florida Gulf Coast University Ecological Research Center is another element designed to help build a

sense of place in its residents through education and facilitating direct engagement in the ranch ecosystems. All commercial buildings will be required to meet LEED standards and achieve the highest standards of the Florida Green Building Coalition Inc. Organic design criteria are being utilized to bring native community green corridors into town, village, and hamlet communities which then connect with more park-like green spaces. Connections to nature are made through access to created lakes, streams, and marshes and in dense neighborhoods through the provision of “empty green lots” for children to play and build “forts” in. Considerable effort to minimize the potential for “nature deficit disorder” (Louv, 98-111) in children and adults through thoughtful community design and experiential programs is built into the Biophylic dimension of the plan.

FIGURE 3B. Babcock Ranch Community Site Map.



Study figure 3b, the Babcock Ranch Community Map, and observe the integration of hydrological and ecological landscape features blending in a way that sustains wildlife, water, and ecological community viability in north and south surface water flow patterns as well as major east–west greenways that support wildlife, water, and human recreation to blend with the development “pods.” The Town Center built upon a “lunar surface-like rock mining” facility adjacent to State Highway 31 and the three villages and five hamlets are built largely on farm fields and pastures minimizing impacts on existing forest and wetland elements. Development transitions from intense in the town center to moderate densities in the interior villages and low density in the hamlets that abut native greenways, wetlands, and cypress slough systems. These are intrinsic land planning principles of Ian McHarg, shared in his text *Designing with Nature* and more recently Kellert with the Biophylic Design principles.

Starting with understanding the “land” as Aldo Leopold defined it and building from a Biophylic template, the Babcock Community Plan has been very well received and has been recognized as an award winning design (Florida Legacy Award).

It is this context that provides the foundation for the Vernacular Design dimension that grounds people into the ecological context of the land, water, plant communities, wildlife, climate, and landscape while the development plans must provide the direct marriage of these features with social/cultural human-designed community elements.

THE CHALLENGE OF CREATING A COMMUNITY IS ONE OF LEADERSHIP, VISION, TEAM PLANNING, AND STRONG BUSINESS AND FINANCIAL SUPPORT

Babcock Ranch Community is a start-up project and as such it has suffered many of the problems that plague a start-up business. The hiring of key staff and consultants, establishing a common “vision,” setting up offices, adding personnel as the expansion of the project grows in complexity, with time pressures including achievement of entitlements create an unsettled environment. The key and most difficult task of finding the “right” Chief Operating Officer (COO) who understands the sustainability community vision and knows the unique attributes of creating and man-

aging a team attuned to designing a green sustainable community, presents a formidable challenge.

In addition to regulatory “blockers,” the inhibitions to change, innovation, and challenges to individual performance and organizational performance of highly competent professionals, are often internally generated. What is required are professionals to internalize the vision, adjust to new modes of thinking, and work strategies and team culture from partners to office support personnel.

The Urban Land Institute publication, *Developing Sustainable Planned Communities*, stipulates “an emerging set of practices that are essential for developers and land owners headed down the green community path need to take three small, but significant steps:

- Define sustainability within the context of the industry and as it applies to the project at hand;
- Define ways to measure sustainability and institute those metrics early on; and
- Define the achievable big benefits early on and focus resources to ensure their success, upping the green ante in each successive stage of development.”

(Heid, Kingsbury, p. 14)

The ULI discussion indicates that, “the process is more holistic about the site’s natural systems, infrastructure, community context, and urban form can result in achieving a higher level of performance at a lower cost.” (Heid, Kingsbury, p. 38). “The design process needs to be guided by a clearly articulated vision statement and set of principles throughout the life of the project as the team works applying strategies, systems and products that best support seeking multidisciplinary solutions that consider linkages and interactions that address multiple problems at the same time. This is essential to a sustainable outcome” (Heid, Kingsbury, p. 38.).

“Historically, planning for community-scale development projects has been linear, starting with land acquisition, market analysis, and engineering studies and followed by conceptual planning design, and construction. At each step of this process, plans are compared to both market and financial parameters and appropriate adjustments are made” (Kellenburg, p. 40). This approach does not give attention to the interrelationships of systems or the non-linear fashion that is typical of how nature works. It is not sensitive

to the ripple effect one decision has on creating impacts on many other key elements of the project and typically ends up costing more and requiring having to fix the unintended consequences that cost more in time and money.

Successful development businesses, who have adopted new principled green self-sustaining approaches with specifically stated outcome targets in their projects, tend to find that not everyone on the staff really internalizes the new approaches to integrated, relational planning and design. The professionals addressing financial, legal, entitlement, and engineering elements tend to respond to the pressure of perceived deadlines, and resort to their very successful methods of the past and get ahead of planning, and the sustainability design options get foreclosed or curtailed and must be adapted or often force-fitted as development progresses. This “planning-as-you-go” is a frustrating and dangerous way to innovate and produce a successful new prototype community plan. The staff working on the entitlement track is efficient, very time-and-business-plan conscious, while the planning group is excited with the opportunity to create and innovate within the parameters the land, marketing people, and business plan parameters suggest. Planners try to define and create community plans that are linked directly to widely accepted elements of sustainability and define specific measurable benchmarks to assess progress. The result is that planners get frustrated that many of the key planning decisions are being preempted and the entitlement staff perceives the planners as slowing down the process and taking too much time, promoting theory and great sounding principles and images that lack implementing specifics, and create delay costs while looking at options and integration with engineering, hydrology, ecological systems, energy, and transportation. This circumstance typically results in a slow down while planning and entitlements become integrated.

Every major new initiative makes mistakes along the way. The successful teams recognize their errors quickly and correct them and don't repeat or live with them. The ineffective teams maintain two tracks of operation, one element clinging to past linear work practice, and a second working in an integrated sub-team relational strategies effort. The two tracks repeatedly try to merge together when crisis or presen-

tation “polish” demands it. The result is a hybrid that tends to have more conventional characteristics with “green” elements and embellishments. Typically it takes three years to create a fully effective, integrated, sustainable change in a culture. The first year is fraught with difficulty as new experience and team vision is built. Start-up problems abound. In the second year things start to smooth out with occasional challenges as everyone “gets it.” Start-up problems disappear. By the third year things tend to work efficiently and become polished as new challenges are met and become routine (observation based upon 48 years of engagement in innovative organizational change at the Fortune 100 companies, education and government systems, and local not-for-profit organizational levels—W.Hammond).

This has been an observation of the Ave Maria Project in Collier County, Florida, and has been problematic for the Babcock Ranch Community planning and implementation approach in its start-up phase. As a very successful golf course and community developer, K&P has encountered this predictable situation when successful professionals are asked to make fundamental changes in their work approach and teaming relationships. Large-scale sustainable development project initiatives are a relatively new phenomenon and require a readjustment transition period as successful professionals develop new mental models, behaviors, and skills. This is only natural as the professional learns the new vocabulary, concepts, applications, teamwork skills, and gains experience and investigates successful new models, and values the directions and vision of top management. Success in integration of the team also demands that it is able to meet the financial and key timeline's deadlines built into the project business plan.

PLANNING APPROACH TO GUIDE LARGE-SCALE, INNOVATIVE DESIGN

The Babcock Ranch Community project has utilized its version of a Biophylic approach in its planning. The Biophylic design strategy was formulated by Stephen Kellert at Yale University as a comprehensive design strategy which integrates three theories of design:

1. High Efficiency
2. Biophylic
3. Vernacular Design

... into sustainable community design practice. The first theory addresses the Services of Nature or Ecological Services concepts, often called High Efficiency Design, that looks at low impact design including total life cycle of materials and energy, efficient design, with low impact on natural systems. This theory is the underpinning that LEED and Green building certification programs are built upon. The Vernacular Design elements encourage design and construction that is attuned to the local environment, history, and context. This approach is focused upon four elements in design;

- In relation to ecology of place
- In relation to cultural and social traditions of place
- In manner that fuses culture and ecology, thus creating an emergent property within a biogeographical and historical context

- In ways that avoid “placelessness” in which a distinctive culture and ecology become so subverted that an area loses its special identity and spirit of place.

(Kellert, p. 166)

Both the Vernacular and Biophilic design theories take integrated approaches that have roots in the fact that human beings evolved on the African continent in forest edge communities. Humans coevolved with wildlife, water, grasslands, forest-edge landscapes that are believed to still be deeply programmed in our genetic fabric. As you travel the deserts of the U.S. Southwest you find residents planting trees in their yards, or, traveling in communities and homes in deep forest canopy, people tend to remove about half to three quarters of the trees on their property to create an “open forest canopy.” In both instances there is a deep need to create shelter, shade, cover with a view

LEED & FGBC & Green Globe Checklist Criteria are omitted but readily available online.

Elements of Biophilic Design	Indicators	Exemplars – Actions	Self Rating (1-5)
Prospect (ability to see into distance)	<ul style="list-style-type: none"> • Brightness in the field of view (windows, bright walls) • Ability to get to a distance point for a better view • Horizon / sky imagery (sun, mountains, clouds) • Strategic viewing conditions • View corridors 	<ul style="list-style-type: none"> • Viewscapes Village III • Interior docks, observation towers • Streetscapes – Terminal view • Greenway parks views • Lot viewscapes in each neighborhood 	
Refuge (sense of enclosure or shelter)	<ul style="list-style-type: none"> • Canopy effect (lowered ceilings, screening, branchlike forms overhead) 	<ul style="list-style-type: none"> • Common design features • Trail tree canopy and shelters • Courtyard designs in public & private spaces 	
Water (indoors or inside views)	<ul style="list-style-type: none"> • Glimmer or reflective surface (suggests clean water) • Moving water (also suggests clean, aerated water) • Symbolic forms of water 	<ul style="list-style-type: none"> • Enhance creeks, flow ways, lakes, urban rain gardens, and urban water features • Graphics in Village III along with lake viewscapes and benches 	
Biodiversity	<ul style="list-style-type: none"> • Varied vegetation indoors and out (large trees, plants, flowers) • Windows designed and placed to incorporate nature views • Outdoor natural areas with rich vegetation and animals 	<ul style="list-style-type: none"> • Native landscape • Greenways, parks, wetlands • Managed and restored wildlife habitat both upland and aquatic • Trail system access to wildlife forests, and the State Preserve 	

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Elements of Biophilic Design	Indicators	Exemplars – Actions	Self Rating (1-5)
Sensory / variability	<ul style="list-style-type: none"> • Changes and variability in environmental color, temperature, air movement, textures, and light over time and spaces • Natural rhythms and processes (natural ventilation and lighting) 	<ul style="list-style-type: none"> • Urban and trail landscape architectural design • Community, trails, green neighborhood design • Sunset and sunrise viewscape orientation, night sky that displays the Milky Way—dark sky 	
Biomimery	<ul style="list-style-type: none"> • Designs derived from natural forms and functions • Use of natural patterns, forms, and textures • Fractal characteristics (self-similarity at different levels of scale with random variation in key features rather than exact repetition) 	<ul style="list-style-type: none"> • Base K&P design implementation everywhere • Development Master Plan design • Curvilinear trails and edges and undulations to roads even on flat landscape. • Building that blend with the landscape ecotones. 	
Sense of playfulness	<ul style="list-style-type: none"> • Incorporation of décor, natural materials, artifacts, objects, and spaces whose primary purpose is to delight, surprise, and amuse 	<ul style="list-style-type: none"> • Local rock, vegetation, ranch icons • Outdoor room design, reflection, and interpretive trail features 	
Enticement	<ul style="list-style-type: none"> • Discovered complexity • Information richness that encourages exploration • Curvilinear surfaces that gradually open information to view 	<ul style="list-style-type: none"> • Transition in development design shorelines, farm animals and viewscape, road network with wildlife crossings, trail system for multi modal access walk, bikes, electric carts, horses 	

Source: Adapted from J. Heerwagen and B. Hase, "Building biophilia: Connecting people to nature," *Environmental Design – Construction* (March 2001): 33. Adapted Kellert – *Building for Life*.

of the horizon and a variety of viewsapes where the resident can see predators, enemies, or just the scenery. In both cases it results in creating the elements of a forest edge. We want roofs and ceilings (most of us like exposed beam ceilings perhaps because it reminds us of the limbs of our tree shelters) but we want to see out windows or doors to the viewsapes. We have an affinity for water, an essential element for life. Thus, we emotionally respond to water bodies, fountains, and even symbolic images of water in pictures or water like surfaces like glass and polished metal that create the illusion of water. More than half of the residents in the U.S. value watching wildlife, and more than one third of people spend sig-

nificant money to watch wildlife within a mile of their home. Retired Harvard Professor Emeritus E.O. Wilson coined the term Biophylyc which he links to our co-evolutionary genetic linkage to our experiences and affinity with wildlife and now our pets.

The large majority of outstanding exemplars of "Green, Sustainable Communities" implementation are New Urbanism type infill projects at the neighborhood scale or relatively small subdivisions of less than 1,000 units. Few, if any, outstanding exemplars exist on a larger scale (more than 6,000+ units). The complexity of capturing the elements that make up an outstanding project such as Serenbe Community in the rural suburbs of Atlanta, Georgia entail much

Vernacular Design	Exemplars – Actions	Self Rating (1-5)
In relation to the ecology of place	Viewscape from each lot, Ed. Prgrm., Neighbors	
In relation to cultural and social conditions of place	Neighborhood design scale, community gardens	
In a manner that fuses culture and ecology, thus creating an emergent property within a biogeographically and historical context	Greenways into neighborhoods and village center 100 m. sight lines to see neighbors on streets/wks	
In ways that avoid “Placelessness,” in which a distinctive culture and ecology become so subverted that an area loses its special identity and spirit of place	Viewscapes, walkability, trails and paths, diversity in housing types on every block. Wildlife interactions. State Preserve connection	
Dr. Phil Tabb: Serenbe	Exemplars – Actions	Self Rating (1-5)
Grounding: Elements that make design connected to land and uses.	Village design/neighborhoods, greenways, native landscaping, waterways, wildlife interaction, walk, bike	
Transects and sectional hierarchy: Greenspace – transect from low density-moderate-high density and back.	Transitions of density and intensity High in village center to low at greenway interfaces	
Open bounding: Multiple entries and trails that flow through the density transects to building center.	Complex extensive trail system with multiple connections, greenway patterns provide accesses	
Diversity and individuality: Variability in building sizes, types, architecture and uses. High degree of individuality.	Diversity in housing and architectural style within neighborhoods, village/hamlet different themes	
Passage and thresholds: Passage from rural transition. Intro of urban sections from curbed urban, gutters, swales.	Road and trail transitions in water roadside transitions in conveyances, greenway-wild to park in village center	
Domain and community spatial order: Build up of density and intensity in urban center. Street transects are major organizers.	Village designs follow Tabb pattern distribution on streets from edge of village to village center with terminal views	
Sustainable technologies and building typologies: Residential building informed by vernaculars which are designed to meet (LEED/Greenbuild standards). Tertiary treatment of wastewater central and decentralized Aerobic and Living Machine type processing in the rural hamlets.	LEED, Florida Coalition Green Building & possibly Green Globe criteria are commitments. Advanced water and water reuse systems, advanced tertiary wastewater treatment with scrubber marshes downstream, Solar and other alternative poser sources, extensive integrated technologies in smart houses and community operations	
Residual space utilization: All spaces within the fabric of the community afford opportunities to create places and support activities beyond residential uses. Parks, landscape, trails, fire pits, reflection walks contribute to the community.	Each of the listed features will be extensively evident in each development pod and in the inter-nodal greenway system which will support the trail system backbone, surface water management, and wildlife corridor functions	

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Dr. Phil Tabb: Serenbe	Exemplars – Actions	Self Rating (1-5)
Authenticity, materiality, and detailing: The diversity of both vernacular and modern architectural styles has integrity to image of the community.	Commons landscape design and the community core will follow the theme that the entire property is still a part of the Babcock Ranch and is a working ranch site with cattle, cowcatchers and their dogs, as well as commercial row cropping and community based organic food production for residents who choose to support and participate in the program.	
Scaling and critical multiplication: Each settlement is sized based upon specific site and desire for pedestrian-oriented place. Each settlement is scaled to specific site. Multiplication means course corrections or adaptive management.	Each community is sized to neighborhood scale with less than a half mile (more typically a quarter mile) walking distance to key amenities such as grocery stores, parks, and the village center. Bikes, electric vehicles, provide alternatives for those with limited walking capacity along roadway and greenway trails	
Continuity and connectivity: Each settlement has a high degree of interconnectedness with roads, trails, walkways, bridle paths and greenways. Each place is placebound as well as interconnected in the web of the other related communities and their unique attributes.	Each village, hamlet and the town center are stand alone for basics with the town center providing the core urban amenities, the Villages most of the core shopping and support professional services while the hamlet have small grocery and boutique shops in their hamlet center. The roads and shortcut trail system makes it convenient to travel from one development pod to another. Each is also supported by dial a number point to point transit and a scheduled “mass transit system” that is reliable.	
Constellation urbanism: The pattern of communities and their relationship to the larger world.	Babcock Ranch Community is connected to Port Charlotte, Ft. Myers and the International airport by a transit system. The community is also integrating to other nearby developments and regional parks through direct trail connections.. The sense of ranch and rural connectivity to the urban town center all reflect the ranch heritage and functional base. Regional wildlife corridors with adjacent State lands are being linked to the wildlife corridors in the community as is the restoration of historic water flows from off site.	

more complexity than just attempting to scale up the features that make these terrific small projects such outstanding models. On the other hand, it is very helpful to examine and seek to harvest the conceptual dimensions that the planners of such unique projects have used to guide planning of the larger scale project. Developer Steve Nygren and architect Dr. Phillip Tabb provide one of the most robust and challenging guidelines we have examined. Few of the national accrediting bodies have assessment criteria that apply to new towns or large-scale developments but are fo-

cused upon conditions critical to infill, urban, suburban context.

K&P utilizes these three design dimensions to inform our plans and to check our plans against a checklist with the criteria from each of these design concepts: Efficient/Low Impact Design, Biophylic Design, and Vernacular design.

The popular image of green sustainable development today is most frequently focused on efficiency, low impact, and services of nature. Many value vernacular architecture which is the important component of

Rocky Mountain Institute	Exemplars – Actions	Self Rating (1–5)
Recognize context	Master Plan illustrates w/greenways & devel. pods	
Treat landscapes as interdependent and interconnected rather than fragmented	Greenways transitions into development pods (each neighborhood) and become park like; viewsapes, trail connections provide connectivity	
Integrate native landscape with development	All commons (medians, parks, lots, and home sites will utilize local native plant community palettes.	
Promote biodiversity	Development is designed to sustain highest quality habitat with ongoing ecological studies of plant and animal communities as well as ecological restoration, removal of exotics, & stream and water body restoration	
Reuse already disturbed areas	We are at about the 93% level on 17,600 acres on disturbed sites with about 400 acres of wetland impacts on this large wetland lush landscape.	
Make a habit of restoration	All exotics removed restoration of creeks, and greenway and wetland with ongoing management plans	
Expand design considerations to recognize distant effects	Avoided any commercial or residential development on adjacent hwy. All development within a large buffer internally. Viewsapes designed to fit local context	
Eliminate concept of waste	Biosolids will become fertilizer for the nursery, a commercial mulching operation will continue onsite using yard waste and forestry slash to create a mulch product. Water, electricity, extreme limitations on fertilizer and reuse of water	
Rely on natural energy flows	Using solar gains, little pumping of water but use structures to create flows and retain hydroperiod	
Educate building industry, clients and consumers about sustainable design	All builders will have to participate in a course and all residents will receive an education on the green practices for homeowners—water & energy conservation, fertilizer minimization, integrated pest management, “Firewise” orientation, and pet control along with living with wildlife that will be ever present. “Don’t chain your poodle to a tree as it will likely become a wildlife hors d’oeuvres!”	

Vernacular Design. Vernacular Design requires that architecture be anchored in the ecological, social, and historic context of the place in which it is built. It is authentic, utilizing local building materials and designed for local climate and socialization patterns.

The third theoretical element described by Stephen Kellert is the Biophilic Element, which emphasizes an organic approach to design. The K&P planning team has utilized this construct as one of the three core constructs for assessing the planning elements of the proj-

ect. A basic core matrix utilizing the Efficiency/Low impact design (LEED and Florida Green Building Coalition [FGBC]) serve as one screen with which most developers are familiar. The second screen is the review of basic Vernacular Design ecological and social sense of place criteria. The third element is Kellert's Biophilic Design consisting of eight key dimensions (see Biophilic Design Checklist).

The planning pattern book will require all commercial building to be designed to at least the LEED silver level. While similar energy saving, efficient, and low impact designs will be required of residential housing, LEED certification will be an option. K&P is using Florida Green Building Coalition standards and is also considering adoption of the Green Globe documentation criteria as it has the potential to become a widely accepted standard that is an aligned match to the Babcock Ranch Community. These programs do help to assess planning alignment with benchmarks.

It is the blending of the High Efficiency, Biophilic, and Vernacular theories of planning, coupled with utilization of screening checklists from sources with deep experience and criteria frameworks, that guide sustainable attributes used to assess development planning proposals and practices that reflect these planning approaches. The use of this type of planning integration tools assures a degree of certainty that design will be self sustaining as well as clearly delineates areas where the plan may need improvement and correction. It also provides the base

for development standards and implementation action. This process guides not just in the regulatory criteria but in the larger criteria of sustainability for the community, state, nation, and planet if these principles and criteria are implemented.

Integrating these three theories into practice will result in a very robust template for creating a truly self-sustaining community plan.

IN SUMMARY, GUIDING DESIGN FRAMEWORK FOR PROJECT GUIDANCE

Theories Connecting Design Strategies Linking Human and Natural Systems

Key Elements	Design Strategy
Ecosystem Services	→ Low Impact Design
Biophilic	→ Organic Design
Sense of Place	→ Vernacular Design/Architecture

(Kellert p. 176.)

Eisenberg's simple diagram (see Figure 4) summarizes this relationship of design elements for efficiency and safety and outside the ring the higher level attributes from the roots of the three theories of design. The inner circle lists the core elements that form the core of regulatory laws, rules, codes addressed in building code. These protect the health, safety, and general welfare of the public. The items listed outside the circle are reflective of impacts from buildings that actually pose a greater risk to society and sustainability on the planet.

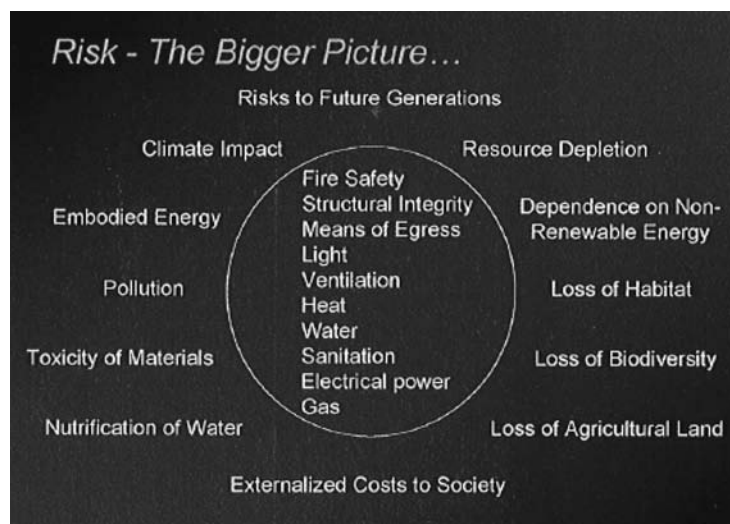


FIGURE 4. (Eisenberg p. 12.)

The integrated Biophilic approach is inclusive of both what is inside and outside the circle represented on the graphic.

A Biophilic approach puts the emphasis on examining the positive and reinforcing interactions of systems of humans and systems of the environment, and not on the current regulatory emphasis that only looks at the negative impacts humans have on the environment that need to be integrated and corrected in the feedback response of a system's relationship.

The integrated alternative is to look equally at all things humans do that impact the environment and all things that the environment does for humans, and carefully examine how those elements interact and function. The Biophilic model requires addressing both of these feedback elements simultaneously by adjusting in advance all things humans consciously or subconsciously value and that we do that have negative impacts on the environment while taking full advantage of blending these positive activities from human interactions with the operations of natural systems, as a proactive rather than reactive response. Thus, a better and more sustainable balance is achieved in the interaction of the environment and human actions.

Biophylic design that integrates human and environment elements requires a non-traditional approach to knowing the land and the biological and sociological regional historic context. It requires deep knowledge and understanding of the ecological, hydrological, and socio-political historic context of not only the land parcel to be developed but the entire region that surrounds it. These factors become the basis for low impact design, formulating the business, entitlement, and marketing plans, and creating a values driven sense of place and spirit that pervades the project. It is this integration that recognizes the emotional connection to the land, landscape, place, which in its deepest expression says, "I love this place, this home, this community, and my neighbors both human and wild."

This approach to land development typically takes a higher front-end expenditure, more time in early planning process, and defining the market niche more precisely than in traditional approaches. While the terminology and integrating theory that underpin the practical implementation benchmark targets for Biophylic, self-sustaining developments are relatively new.

The fundamental planning strategy difficulty is typically in achieving the teaming, thinking skills, and behavioral changes into the processes of those financing, administering, designing, engineering, and planning the implementation to building the community.

The initiative of K&P to apply the Biophylic approach to planning, designing, and building the Babcock Ranch Community is a bold one and it provides a solid platform for creating a new growing edge, designed, sustainable community. It also sets for K&P the major challenge of changing the everyday internal corporate ways of thinking and doing business. It presents the challenge of educating the layers of regulatory agencies, and the elected leaders who oversee them, to think in a more relational, integrated, positive systems mode rather than in the historic deficit mode. This type of integrated approach is also foreign to most regulators at all levels and is often greeted with skepticism and suspicion of just being "greenwash" rather than a sincere sustainable planning approach.

The mindset of K&P culture in relation to planning and permitting in a very dynamic community in flux, economy, technological, transportation, energy, politics, and social change dictates keeping options open as change is occurring rapidly and will open new options.

When approaching permitting and approvals and attempting to forge new ground, the basic response is twofold:

1. To do the "right thing" as best as science and policy indicate is the right thing.
2. To seek permitting at the most flexible level to allow all good programs to flourish.

While in the hands of ethical people the first response, "do the right thing" is a well considered choice based upon examination of sustainable practices, financial constraints, political constraints, and best available science and data. It also can be a relativistic choice when not grounded in a set of goals, principles, and sound practice.

The following discussion provides samples of specific exemplars of requirements and expanded program elements developed by K&P. These elements were largely due to the scale or size of the project scope and acreage and the response encountered by the regulatory bodies to K&P plans. The intention is that

these exemplars might provide insight to others in the industry that may be implementing or even contemplating engaging in large-scale community building.

The most challenging elements are master planning and creating a Pattern Book framework that assures the vision is held true in the building process; the hydrology and traffic are the most difficult and are based upon sophisticated greater than state-of-the-art computer models; ecological systems are very sophisticated, particularly in this project with 17 listed species, including some of the most endangered, and the largest State Preserve adjoining the project property; and then the cutting edge challenges of energy, green building, and advanced technologies, are all exciting to explore and apply.

PLANNING & DESIGN

Master Planning has been accomplished as an iterative process between K&P staff and planners at Wilson Miller Inc. The Master Site Plan observed in figure 3 is version Edition 6. The Master Plan was developed after careful assessment of the land, hydrologic, wildlife, and existing land uses and modifications as well as influences in relationship to the Babcock Ranch Preserve and surrounding properties. The first phase of the Plan's implementation is Village III driven by the fact it is close to the entrance road and the master utility site which will contain a tertiary wastewater treatment plant, an RO water plant, power substation, Sheriff station, Emergency Medical Services (EMS), and Fire Station. The efficiency of extending utilities from their source makes beginning with Village III the first element to be built a sound choice. Village III will support 1,592 housing units with 10% affordable housing, 80,000 sq. ft. of non-residential, and consideration of solar orientation and viewscales. This Village, being the first and located on more than a square mile of lake system (reclaimed rock mine lake) will showcase examples of each of the product types being utilized in later development phases. Ranch estates, equestrian home sites with common pasture and barn, lakeside cottages and premium houses, multifamily, mixed use town center of two and three stories, and six key neighborhoods each designed into sub-neighborhoods to create social interaction and a community garden are included. Each neighborhood has a major greenway feature or park

shaping it. A series of major lakeside parks and trail system makes boating (no internal combustion engines, only electric, sail, or human powered) allowed. Hamlet I is the northern most Hamlet adjacent to the major wildlife corridor and the Florida Gulf Coast Ecological Research Center and Observatory. This hamlet will be the nature lover's paradise. The upper section of the Town Center on the southern shoreline of the Large Rock Mining Lake will be the most intensely developed site in Phase I. This element is critical to provide commercial and light industrial space for new businesses moving in early Phase I to create jobs and help assure the vehicle capture rate projections can be met.

Since K&P are primarily horizontal developers, the key to assuring that vertical builders integrate the sustainable vision into their element of the project is through a comprehensive Pattern Book that covers architectural, building materials (e.g., no vinyl siding or soffits, fire-proof roof materials—(control burning will be conducted, Fire-wise community)), street signage, hurricane-proof furniture, use of native landscaping palettes, and preplanned surface water management BMP's are but some of the items framed in the Pattern Book and education orientation for every builder.

K&P will build some of the first mixed use office-residential buildings in the Village III center as well as a grocery store, lodge, and other needed start-up elements. The key is to assure Village III offers the features characteristic of a more mature village that residents and visitors to the lake need and want at start-up.

Hydrology

South Florida receives more than 50 inches of rainfall and has groundwater that both travels from distant recharge areas and is also directly linked to local surface water influences. The region normally experiences a wet and dry season that transitions from a "wet season" with tropical rains and hurricane systems (that can dump 20+ inches of rain in a few days) for about six months of the year and a few months of transition in late fall and late spring with desert-like conditions for most of the balance of the four month winter-early spring "dry season."

Water is the most critical element in the design of a sustainable community on the landscape, especially

FIGURE 5.

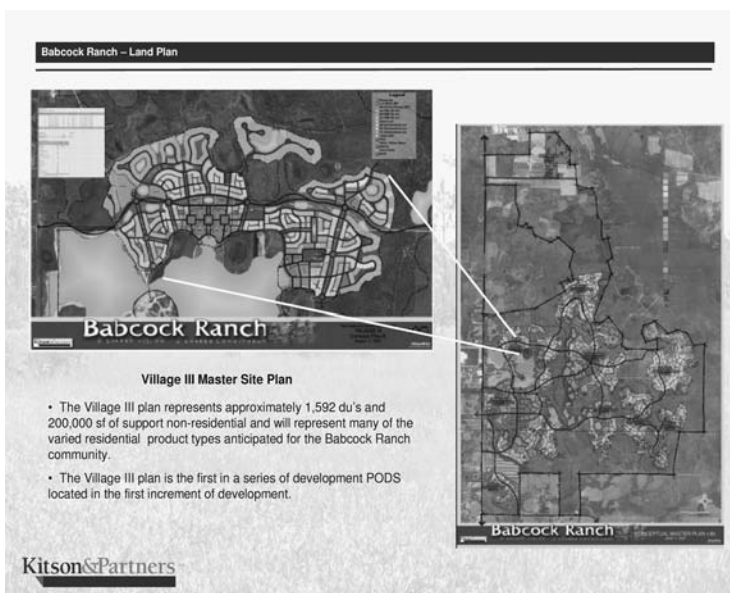
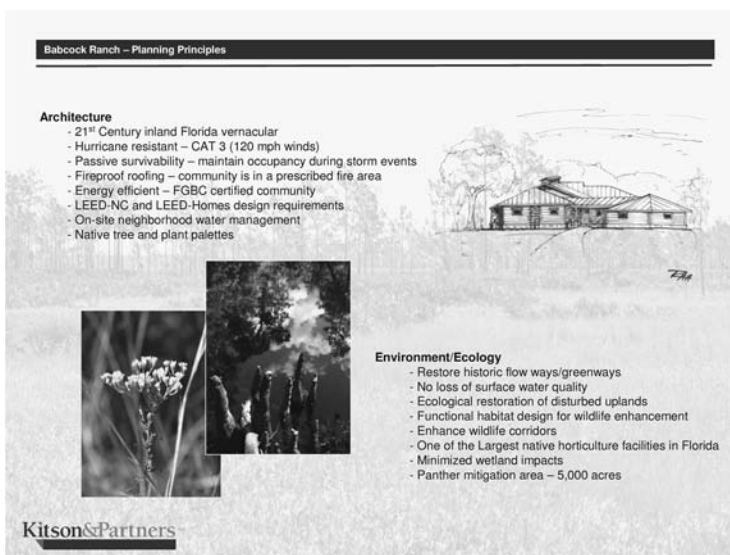


FIGURE 6.



in Southwest Florida. The Babcock Ranch property is very flat throughout the Northern two-thirds of the property. The Southern third of the property drops more steeply for a few miles (almost 29 feet) to the Caloosahatchee River. This is one of the steepest natural slopes in SW Florida. A heavy rainy season causes incised channels that become creek beds that flow to the Caloosahatchee River. The eastern boundary of

the Babcock Ranch Community is bounded by the Telegraph Swamp, a hydric Southern Forest Cypress Slough (5,000 acre swamp) which has a central meandering channel, called Telegraph Creek, which also flows to the Caloosahatchee River.

These extreme South Florida conditions require the South Florida Water Management District (SFWMD) to implement and enforce a stringent sur-

face and groundwater permitting program which attempts to balance the need for surface water flood control criteria and, within the same rule set, emphasize water conservation. To gather data to examine pre-development hydrologic conditions, a substantial number of wells that have been on the Ranch for years have flow data available. However, these were not nearly enough on a property that is nearly 45 square miles in area. More than 100 additional wells, both deep to the Floridian Aquifer (brackish that will be used for potable water supply), and piezometers that are very shallow wells set approximately six feet deep. A water budget for the development which accommodates regional influences, including inflow both surface and groundwater, rainfall, percolation, evapotranspiration, and run-off, must be determined.

The South Florida Water Management District permitting process challenge to this project is that it must determine the attributes of the pre-post runoff conditions. This includes the worst case design scenario to accommodate a 25-year rain event (as well as a 100-year event) to assess runoff rates and volume when all lakes and water bodies are totally full. Typically developers are required to design to a surface runoff number predetermined by the SFWMD and validate their development conforms. In the Babcock Ranch Community case a modeling protocol was agreed upon (using the integration of four computer models) to determine the acceptable runoff rate due to the exceptional size of the Community.

We are using four basic models in our Hydrologic modeling efforts: HEC-HMS, PRMS, Modflow, and HEC-RAS. The first two, HEC-HMS and PRMS, are basically parametric water budget models. Both use land use, climatic, and hydrologic data to provide temporal estimates of runoff, ET, and recharge. The third model (Modflow) will provide more detailed hydrologic modeling because it is a three-dimensional, finite difference groundwater flow model that more accurately simulates the groundwater aquifer units and the hydrologic processes. Because Modflow simulates the groundwater units, it will allow us to calibrate the model to the groundwater level elevation measurements that are being collected. Using special modules Modflow will also be used to simulate wetland hydraulics and processes. Output from all of the aforementioned models will be used in conjunction with the HEC-RAS model. HEC-RAS simulates the

open channel flow hydraulics and dendritic stream routing of the surface water features that carry surface water to the Caloosahatchee River. The results of all of the models will be calibrated to measured stream flow data that is being collected as part of the Johnson Engineering Inc. monitoring program.

A brief summary description of each model follows:

The Hydrologic Modeling System (HEC-HMS) is being used initially to evaluate storm water runoff from the site under pre- and post-development conditions for select storm events. HEC-HMS was developed by the U.S. Army Corps of Engineers Hydrologic Engineering Center (HEC). The HEC-HMS model is designed to simulate the rainfall-runoff processes for dendritic watershed systems. It can be applied to a wide range of studies, including flood hydrology and the analysis of runoff from small urban or natural watersheds. Hydrographs of flow and stage (stream surface elevation) produced by HEC-HMS can be used directly or in conjunction with other software (e.g., HEC-RAS) for studies of urban drainage, flow forecasting, future urbanization impact, flood damage reduction, and floodplain regulation.

The USGS Precipitation-Runoff-Modeling-System (PRMS) will be applied to simulate continuous longer term simulations. PRMS is an open-source code for calculating all components of the hydrologic cycle on a watershed or sub-watershed scale. PRMS is a modular, deterministic, distributed-parameter modeling system developed to evaluate the impacts of various combinations of precipitation, climate, and land use on stream flow and groundwater recharge. The modular design provides a flexible framework for model enhancement. PRMS will enable us to provide short-term answers to continuous simulation questions raised by the SFWMD and Lee County.

MODFLOW simulates steady and non-steady flow in an irregularly shaped flow system in which aquifer layers can be confined, unconfined, or a combination of confined and unconfined. Flow from external stresses, such as flow to wells, aerial recharge, evapotranspiration, flow to drains, and flow through river beds, can be simulated. Hydraulic conductivities or transmissivities for any layer may differ spatially and be anisotropic (restricted to having the principal direction aligned with the grid axes and the anisotropy ratio between horizontal coordinate directions is fixed in any one layer), and the storage coefficient may be

heterogeneous. The model requires input of the ratio of vertical hydraulic conductivity to distance between vertically adjacent block centers. Specified head and specified flux boundaries can be simulated as can a head dependent flux across the model's outer boundary that allows water to be supplied to a boundary block in the modeled area at a rate proportional to the current head difference between a "source" of water outside the modeled area and the boundary block. MODFLOW is currently the most used numerical model in the U.S. Geological Survey for groundwater flow situations.

HEC-RAS is a one-dimensional hydraulic flow model designed to aid hydraulic engineers in channel flow analysis and floodplain determination. The results of the model can be applied in floodplain

A complex seven county computer model traffic study has been prepared to predict demand and capture rate of traffic generated by the development. The model predicts road needs and is used for determining road phasing and impact fee and construction costs associated with development phasing. A multi-modal transportation system includes mass transit, traditional vehicles, New Electric Vehicles (NEVs), electric carts, bikes, Segways, and pedestrians. All elements are integrated in the Master Plan which, through design, deemphasizes driving internal combustion vehicles and emphasizes utilization of the more than 50 miles of trails and cart paths rather than roads. NEV's will travel on local roads and use special cart trails to follow shortest alternative routes. Regular mass transit will be provided by the developer. Every effort is being made to encourage people not to use their cars or trucks but use more convenient trails and mass transit or walking, using the biking and electric cart exchange and recharge stations. Road calming design, low speed limits, limited parking, changing road treatments such as swales, gutters, and curbs, curves, bridges, traffic cir-

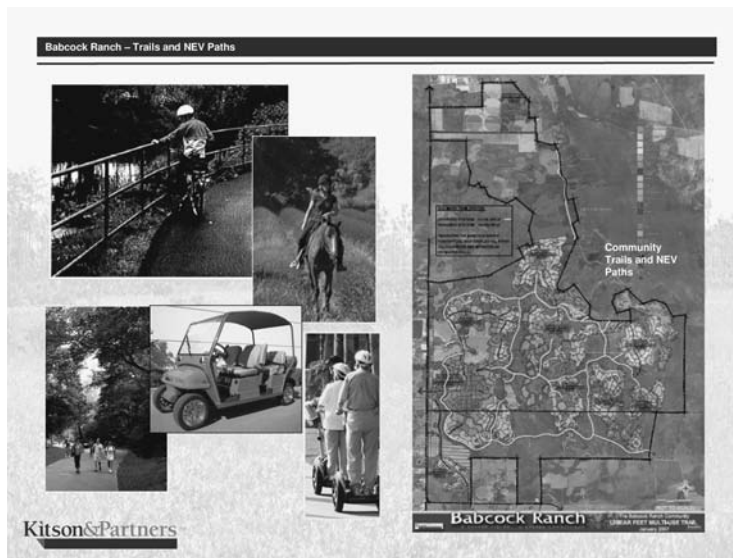


FIGURE 8.

cles, as speed transition cues, are geared to less than 45 mph top speed along major arteries. Using a grid street design in community centers and a network of trunk roads with few traffic lights, all are designed for safety, efficiency, and traffic capture within the development property as almost all of residents needs are available within the community. The internal capture rate of vehicular traffic is critical to the sustainability plan and the financial plan which provides significant savings and incentives for not generating traffic to off-site destinations.

EDUCATIONAL PROGRAMS

Core Babcock Community

Education/Interpretation Elements

It is easy to indicate in a technical journal that education is important and leave it at that. However, education is the glue and mortar that provides the cultural context and “buy-in” to valuing green construction, technologies, and lifestyle change. It is not static and must be upgraded and evolve with the community. Some of the key elements of the Babcock Ranch Community, all of which are infused with living efficiently and “green,” that support the delivery of education programs and facilities are:

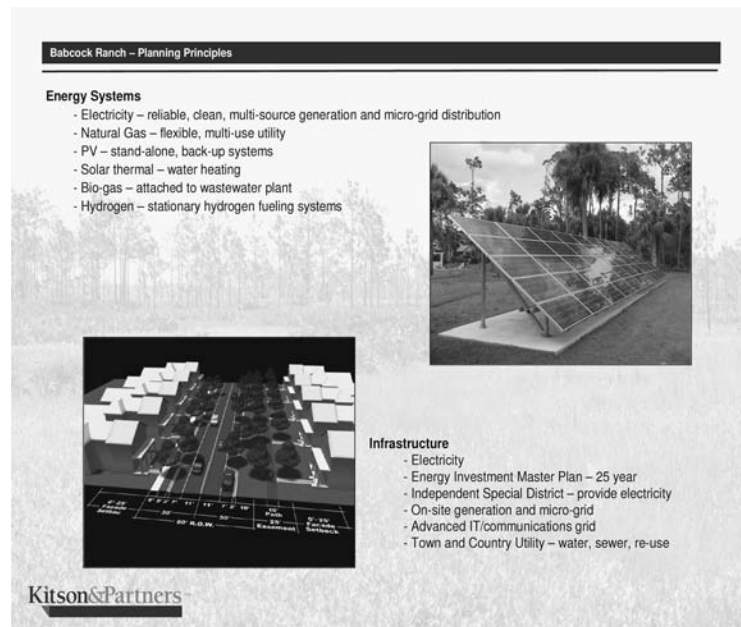
Formal Education System Elements

- **Elementary and Secondary Schools** – Support creation of six public schools (three elementary,

one middle, and one high school) in Charlotte County and one elementary school in Lee County. Each of these schools will be designed to meet at least LEED silver or better standards, and utilize native plant community landscape designs to enhance instruction, and minimize maintenance, and energy consumption while creating wildlife habitat.

- **Babcock Public Schools** – The role of the Charlotte and Lee County Public Schools is to provide a pre-K through High School Environmental Education Program as a core element of the Basic Studies Programs. Community support shall fund a systematic field trip and field studies program for all students using the Ranch as a primary instructional resource. In addition, Adult and Community Education Programs will be supported in the public schools.
- **Babcock Community – FGCU Ecological Research Center** – The Center’s staff will conduct primary research on the Babcock Ranch and Babcock Community lands and resources as well as conducting research in the surrounding region. Staff will also support community information briefings, programs, tours, and open house sessions with guest lectures and eminent scholar research investigations and findings.
- **Higher Education** – Development of the FGCU Ecological Research Center and sub-center for

FIGURE 9.



ecological and astronomical studies. FGCU will offer community based programs and courses, community forums and speaker events, in addition to graduate and undergraduate classes and research programs. FGCU may collaborate with other Florida, as well as national and international, universities and colleges that offer community based learning experiences.

- **Edison College** – may provide classes and training courses and seminars within the Babcock Ranch Community.

The potential for **private or public Charter Schools** or **parochial schools** may also be introduced within the Babcock Ranch Community

Non-Formal Education Systems Elements

- **Babcock Institute** – Provides Community Governance, Community Association, overall coordination of community policy and regulatory orientation and enforcement. The Institute will provide leadership in orienting customers, builders, producing educational and training materials and programs, and organizing and facilitating a community member networking program that builds connectivity and a sense of place for every resi-

dent. It will be responsible for seeing that no person is left lonely or disengaged from the Babcock Community and their neighborhood community members. The Institute will also foster and support community and networks of practice that bring specific, cross-aged interest groups together in all regions of the community.

- **Community Nature Center** – Community Environmental Education Focal facility for community education, orientation of new residents to the wildlife, energy, recycling, native plant landscaping programs, yard care, trail systems, water quality problems and issues, and mosquito and pest management systems. The Nature Center will also lead tours, kayaking, through the Green design and built community, agricultural features, and natural systems elements of the Babcock Community. Guest speaker and lecture programs and extended field trips off site will be sponsored by the Nature Center.
- **Babcock Community Trail and Written Graphic Communication System** – A network of miles of greenway trail system (walking, bike, electric carts, and bridle paths) will be created to connect all areas of the Babcock Community and also provide access linkages to the Florida Babcock

IT/Communications

- Technology Investment Master Plan – 25 years of flexible adaptation to change
- Communications utility – open system
- Fiber backbone and wireless network
- Multi-outside services carrier hotels for vendors
- Full communications and data services to residences and businesses

**Ranch Planning and Management**

- Existing ranch operations to be maintained
- Ranching 3-5,000 head of cattle on 73,000 acres
- Logging slash pine – select forestry
- Farming 2200 acres
- Sod farming 1250 acres
- Mining – fill, shell, and limestone rock
- Eco-tours for 30,000 people annually
- Hunting leases
- Gator Ranching
- Restoration Plant and seed harvesting
- Native plant nursery

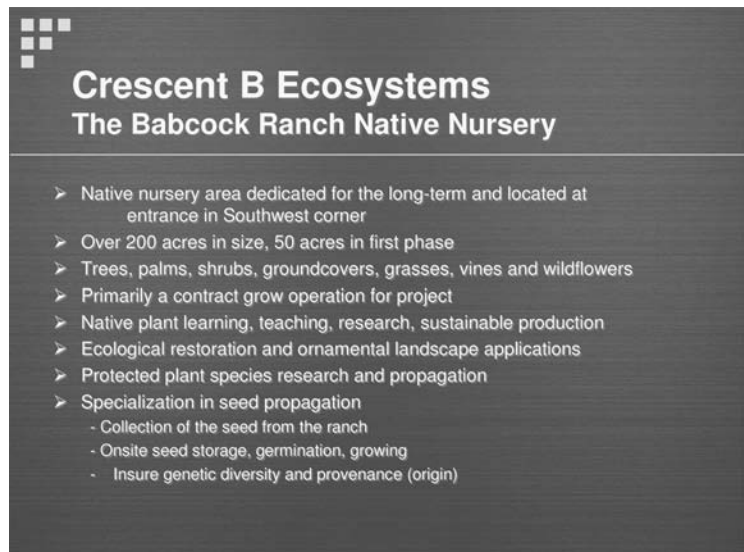
Kitson&Partners

FIGURE 10.

Preserve Trail System. This system is in addition to the pedestrian and bike paths that will be in a separate native landscaped transportation corridor parallel to the primary road network. Interpretive kiosks, signage, and exhibits may be utilized at key locations along this trail network.

- **Community (Crescent B Ecosystems) Native Plant Nursery Program and Demonstration Learning Center** – More than 250 acres of native trees, shrubs, grasses, and wildflowers will be produced to restore and landscape the community (largely built upon old farm fields and rock mine sites) from seed and cutting sources on the Ranch. An extensive native plant landscaping demonstration center and education facility will teach residents about all aspects of native plant community landscaping and related environmental practices such as integrated pest management.
- **Community Service Agriculture** – A network of Community Agriculture systems based on existing farm fields (more than 250 acres designated) that produce organically grown vegetables, free range chicken, and beef from the Ranch cattle operations will provide food safety and convenience for participating residents.
- **Babcock Community Learning Centers** – The town center, each village, and hamlet should have a community facility that supports arts, crafts, interest clubs, a shop, a game room, and classroom/meeting room facilities that become central to stimulating “hot groups,” interest groups, community events, and presentations.
- **Community Coop Farming and Community Gardening Programs** – Every resident shall be eligible to participate in the Coop farming operations and the community garden facilities in each neighborhood in the Town Center and Villages. The Coop Farming program will be supervised by a funded farm manager and will require each resident to donate “X” hours of service to the program in the field, office, or support work. Shareholders shall decide what the priority crops will be each season with the counsel of the Farm Manager. Each Community Garden Site will be supported by a person from the Nature Center to assure effective success and management of the garden facility as well as supporting participant’s social networking.
- **Community Eco-Agro-Recreational Tourism Outfitters** – Certified /approved tour providers will supply tours and recreational experiences for residents and visitors into approved venues on the Babcock Ranch and Babcock State Preserve via bikes, approved vehicles, walking/hiking, canoe/Kayak, Segways, and other appropriate means on a fee basis.
- **Wild Play Lots and Fishing, Dip Netting** – The developer is considering leaving some lots in each

FIGURE 11 AND 12. Landscape and Native Plant Nursery Program.



neighborhood undeveloped and restored in native vegetation in areas not in close proximity of a greenway corridor for children to “play and explore the woods in their neighborhood.” It will also create fishing docks, pavilions, and dip net steps along shorelines of environmental study areas on lakes and creeks.

- **Nature Based Day Care Facilities for Pre-schoolers and Senior Adults** – Private sector development of a network of day care centers

that are focused on engaging participants in nature based experiences and learning activities will be promoted for cross generational opportunities in the community.

- **Community Camp(s)** – Provide learning opportunities for youth and adults in a non-formal learning venue and provide connectivity to the land and learning out of doors.
- **Community Based Not-for-Profits** – Will support education in the specific interest areas and

facilitate distribution of community information, guidelines, policy, and programs.

The context that frames the challenges facing design, planning, permitting, and implementing this development project is best summarized in a quote offered by K&P Vice President for Transportation:

“This is a Community Planning effort at a massive scale and sustainability level of sophistication that no one has ever done before, on a timeline to be accomplished in less time than ever before, in a conservative community that does not readily embrace change.”

Steve Webb,
Vice President Transportation K&P

RECOMMENDATIONS FOR CONSIDERATION BY OTHERS CONTEMPLATING OR ENGAGED IN LARGE-SCALE SUSTAINABLE DEVELOPMENT PROJECTS

1. This is a very positive time to engage in large-scale sustainable development with a conservation and Biophylic approach to sustainable development. Large tracts are becoming available as a growing trend as heirs do not want to continue farming or ranching, so land is available. With the current real estate slowdown, land values make it an attractive time to purchase. If you can find a strategy of preserving more than sixty percent of the land in some agricultural or working ranch, or other recreational use that protects and restores natural systems, you are continuing to raise the bar for ethical uses of the remaining large tracts. The market for self-sustaining green communities meets the growing choice many people are looking for to reconnect to nature and to live in a community that builds social connections and fosters a sense of place, offers food security, and relative hurricane safety, as well as all the amenities and services one needs that are reachable by bike or electric cart. Public purchase of a large component of the land or through private entities, such as The Nature Conservancy or the Trust for Public Land are potential partners for bargain sales which provide the developer with an offset income to make the developer's financial plan feasible.
2. K&P utilized an element of Florida Law that allows a new town or city development if it can demonstrate it will implement its own utilities for water, wastewater, energy, emergency services, and have a substantial transportation internal capture rate of residents who do not have to commute to work, to shop, and to get medical or other services that they may need. If it can implement a scientific means for measuring the internal capture rate and can meet the capture rate in an agreed upon time frame, the development is not considered to be contributing to urban sprawl.
3. Utilization of a Planning Framework Matrix aligned with the project's vision as a template provides a team with planning guidance and convenient assessment tools to test each new element of the planning and development process alignment with the guiding vision.
4. Utilize sound ecological, hydrological science as early as possible to create a foundation for planning decisions and similar computer science based modeling to support traffic, fiscal, and other related planning decisions.
5. This is an ideal time to work with local, state (including the Governor), federal (including the President) elected leaders and staff, private investors on energy generation, conservation initiatives and land development code changes. Such initiatives are essential to effective green-building projects, especially large-scale projects that have the capacity to produce alternative energy crops, solar, and co-generation materials, and utilize thermal exchange and other emerging opportunities. Being a large-scale developer gives you considerable leverage and opportunity to become a player in field testing and pioneering new opportunities.
6. Hire a Project leader who embraces the vision of the CEO and investors in the creation of a self-sustaining community.
7. Provide orientation and training for all employees, especially those who have long successful experience in the traditional development business. Self-sustaining new communities are not just another builder's "style;" they are substantially different in the conception and execution. Training and teambuilding experiences are essential to the success of large projects for both horizontal

builders and with highly motivated and skilled teams to build common vision and collaboration at the cross disciplinary non-linear sustainability planning process.

8. Keep all of your decision making and key work transparent to the public and agencies while maintaining integrity and consistency; as you always take the “high road” even when you encounter blockers, and your reptilian brain says the law is on your side and “you can ram or lawyer it through” or get even for past abuses you have endured since you are affirmed as right. Doing what is right will not always be the most popular route or the easiest.
9. Work with leaders in fields where technology is rapidly changing to avoid dead end applications and design with adaptation and flexibility in order to accommodate the extensive change. This includes building in the ground utilities with significant extra capacity for utilities and IT expansion. The advantage of being a large-scale developer with an innovative project is that major companies, as well as the Governor and Legislators, are willing to meet and share ideas and possibilities with you as a potential partner and market.
10. Finally, do your homework well and when you are asked in agency negotiations or community forums to do the unreasonable, without sound justification, use your homework to present a clear understanding of why you must say no!

CONCLUSIONS

While the Babcock Ranch Community Project is relatively young, a great deal has been learned. The essence of one of the most important conclusions we can share is summarized in a statement offered by K&P Senior Vice President, Terry Holihen:

Not only must the vision be clearly defined and articulated, the implementing details of the vision need to be clearly articulated, vetted out, endorsed, and documented (but not necessarily incorporated into the permits). The implementation details need to be clearly defined action items. This requires appropriate time to be time-lined for the “Program” to be defined. The paradigm shift is realizing that this time is necessary.

A second conclusion grows from the professional challenge as an individual and professional team member engaged in creating something unique and uncharted.

The experience of creating a large-scale “green” self-sustaining community that meets the ideals and challenges illustrated in the theories and checklists we borrow from the work of many of our mentors and colleagues has allowed us an opportunity to move forward rapidly utilizing every bit of our education, knowledge, and experience to make this a career cornerstone for the entire team. Many top performers have given up secure, important positions to join the work effort on this “high risk”, environmental and community design challenge to create a large-scale pioneering sustainability project. The attraction it is filled with creative opportunity and the exciting possibility that we are making a difference. Each of us really believe it is important to create new models in an ethical and caring “green” way using approaches that will change thinking and practice not only in our own region but far beyond. It is an experience that inspires you as you work with a very diverse, intelligent, caring, talented, highly experienced, and open-minded team you learn from every day. The magic of the experience is that it applies at all levels from the Partners, CEO, staff team, and to the consultants. Florida’s largest State Preserve has been acquired; the Babcock Ranch is “saved;” the master plan receives high marks and is already being copied; the environmental permitting has moved forward; and the first development phase is underway. The team is growing fast and is continually making progress (far more rapidly than the three year model) in integrating new members to the vision and creative challenge. The project has accomplished an amazing success in a little over a year considering few thought it had any chance of succeeding. It has generated the attention and support of the Governor (past two), legislators, and Fortune 100 corporate leaders, and many in the environmental and business world. It is a laboratory for new ecological and social planning, transportation, communications, technology, community design, but more important, creating new relationships that build community, establishing a sense of place, and provides a leading edge practice that assures that no resident should ever suffer from “nature deficit disorder!”

One more thing to consider:

It is important, both individually and as a team, to soak in and celebrate the excitement of being on the growing edge of working on a sustainable project that can make a significant difference in the way we relate to the environment and to one another, knowing if we do it well others will follow our lead!

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