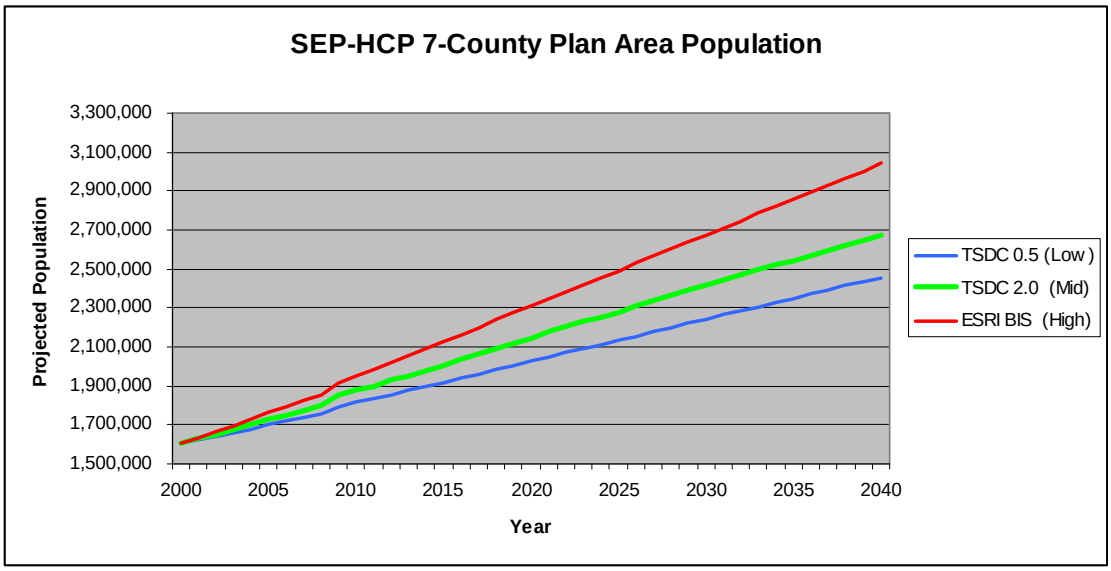
SEP-HCP PRELIMINARY IMPACTS ANALYSIS SUMMARY

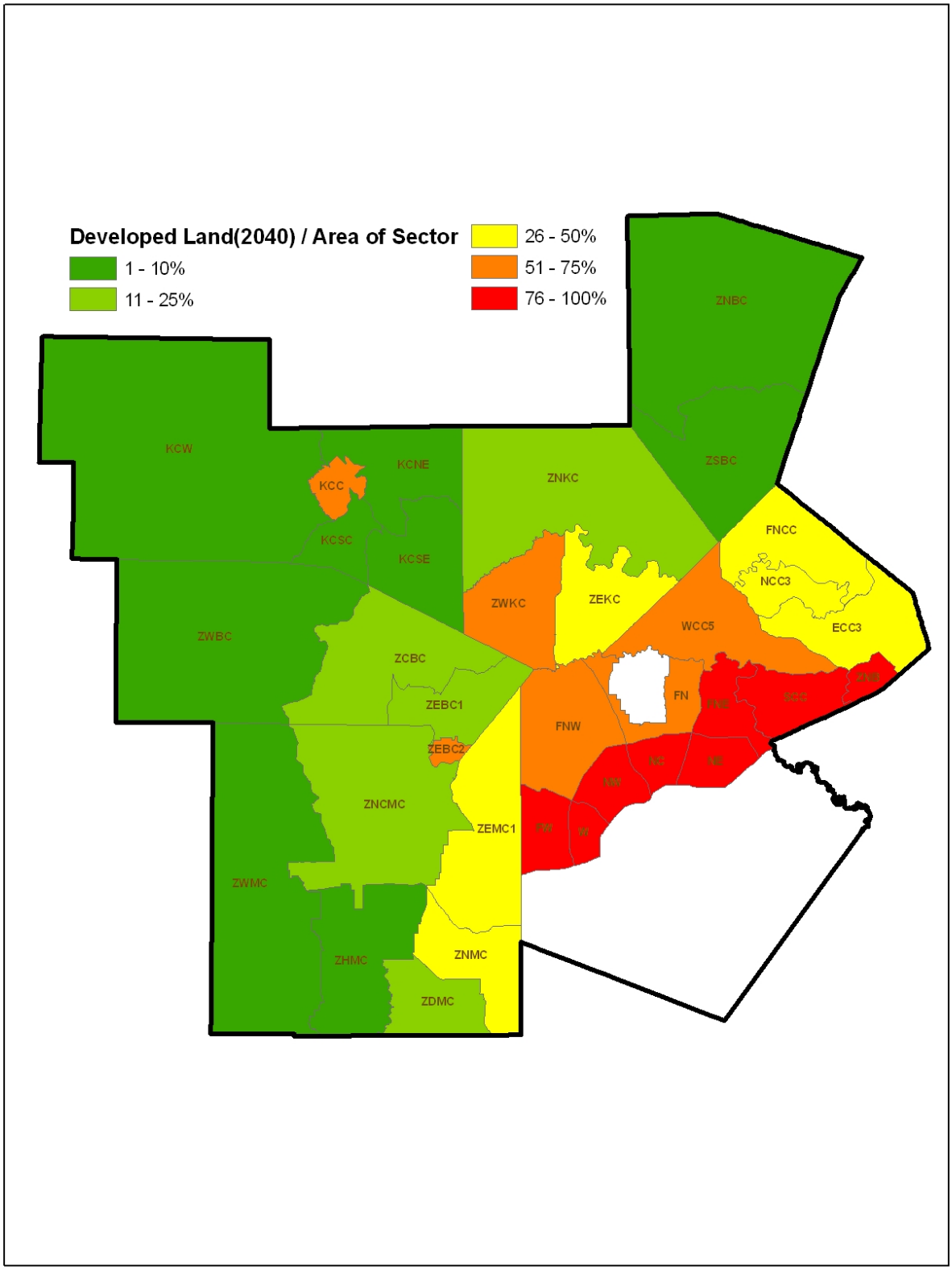
Projected Population Growth



Land Development Projections – Revised Version

Revisions included increasing the target density for single-family residential development in some areas (has the effect of reducing the amount of land development needed to accommodate the population increase) and more evenly distributing projected development over time.

County	Area of LU Sectors (ac)	Acres of New Development				Total Acres of New Development 2010 - 2040
		2000 - 2009	2010 - 2020	2020 - 2030	2030 - 2040	
Bandera	510,319	6,538	3,176	4,104	7,972	15,252
Bexar	300,101	64,163	48,859	41,692	596	91,147
Blanco	456,589	677	495	727	3,502	4,724
Comal	367,673	45,387	18,227	21,978	46,619	86,824
Kendall	424,289	22,663	6,009	12,582	25,011	43,602
Kerr	708,840	5,336	2,221	3,770	5,874	11,865
Medina	853,888	11,622	3,652	9,173	9,428	22,253
TOTAL	**3,621,699**	**156,386**	**82,639**	**94,026**	**99,002**	**275,667**
w/o Comal	**3,254,026**	**110,999**	**64,412**	**72,048**	**52,383**	**188,843**


Developed Land(2040) / Area of Sector
1 - 10%
11 - 25%
26 - 50%
51 - 75%
76 - 100%
ZNBC
KCW
KCNE
KCC
ZSBC
ZNKC
KCSC
KCSE
FNCC
NCC3
ZWKC
ZEKC
ECC3
WCC5
ZWBC
ZCBC
ZEBC1
FN
FNW
ZEBC2
ZNCMC
ZEMC1
ZWMC
ZHMC
ZNMC
ZDMC

Estimated GCW Habitat Loss – Model L (Revised)

County	Potential GCW Habitat in 2000 (ac)*			Estimated GCW Habitat Loss 2010 – 2040 (ac)			
	Low Estimate	Mid Estimate	High Estimate	Low Estimate	Mid Estimate	High Estimate	Average Annual Loss (Mid)
Bandera	103,919	218,963	244,466	2,131	5,519	6,502	184
Bexar	52,069	92,785	99,880	13,546	24,487	26,508	816
Blanco	20,591	79,526	113,754	195	969	1,344	32
Comal	72,016	157,961	173,950	16,194	36,949	40,454	1,232
Kendall	18,778	80,371	112,133	3,822	12,072	14,978	402
Kerr	83,755	201,368	234,591	610	2,785	3,442	93
Medina	73,527	113,833	121,440	2,381	3,135	3,249	105
TOTAL	**424,655**	**944,807**	**1,100,214**	**38,879**	**85,916**	**96,477**	**2,864**
w/o Comal	**352,639**	**786,846**	**926,264**	**22,685**	**48,967**	**56,023**	**1,632**

* GCW habitat estimates based on Loomis GCW Habitat Model:

- Low Estimate = Potential habitat of any quality class that is **Likely To Be Occupied**
- Mid Estimate = Potential habitat of any quality class that **May Be** or is **Likely To Be Occupied**
- High Estimate = Complete Loomis Model - **all quality and occupancy** classes (including habitat that is **Not Likely To Be Occupied**)

Estimated GCW Habitat Loss – Model C (Revised)

County	Potential GCW Habitat in 2000 (ac)*			Estimated GCW Habitat Loss 2010 – 2040 (ac)			
	Low Estimate	Mid Estimate	High Estimate	Low Estimate	Mid Estimate	High Estimate	Average Annual Loss (Mid)
Bandera	140,569	190,171	259,717	3,429	4,855	7,084	157
Bexar	68,933	85,839	108,610	17,787	22,488	28,563	726
Blanco	35,959	60,448	110,562	335	656	1,302	21
Comal	79,487	113,032	165,986	20,016	27,494	39,699	887
Kendall	49,258	77,547	136,837	7,604	11,113	17,374	359
Kerr	111,601	166,589	258,965	1,350	2,256	3,923	73
Medina	96,471	122,862	154,116	2,701	3,249	3,837	105
TOTAL	**582,278**	**816,488**	**1,194,793**	**53,222**	**72,111**	**101,782**	**2,326**
w/o Comal	**502,791**	**703,456**	**1,028,807**	**33,206**	**44,617**	**62,083**	**1,439**

* GCW habitat estimates based on Diamond (2007) Model C:

- Low Estimate = Rank 4 Habitat
- Mid Estimate = Rank 3 and Rank 4 Habitat
- High Estimate = Ranks 1 - 4

Estimated BCV Habitat Loss (Revised)

County	BCV Habitat Estimate (ac)*	Estimated BCV Habitat Loss 2010 – 2040 (ac)	Ave Annual BCV Habitat Loss 2010 – 2040 (ac)
Bandera	7,599	7,599	227
Bexar	47,854	47,854	5,425
Blanco	2,275	2,275	24
Comal	3,591	3,591	848
Kendall	4,945	4,945	509
Kerr	53,074	53,074	889
Medina	62,292	62,292	1,621
TOTAL	**181,630**	**9,543**	**308**
TOTAL w/o Comal	**178,039**	**8,695**	**281**

- As reported in Wilkins et al. (2006)

Estimated Karst Invertebrate Habitat Loss (Revised)

County	Sector	KFR Area	Estimated Number of Species Caves - Zones 1 and 2	Estimated Number of Species Caves - Zones 3 and 4	Karst Zone 1 & 2 Impacts 2010 - 2040	Karst Zone 3 & 4 Impacts 2010 - 2040	Estimated Number of Species Caves Affected by Development (2010 - 2040)	% of Total Est. Caves
Bandera	ZEBC1	Northern KFRs	-	-	-	23	0	0%
Bandera	ZEBC2	Northern KFRs	-	-	-	30	0	0%
Bexar	FN	Northern KFRs	97	-	8,561	4,098	11	11%
Bexar	FNE	Northern KFRs	132	-	12,843	4,012	16	12%
Bexar	FNW	Northern KFRs	176	2	10,301	9,511	13	7%
Bexar	FW	Culebra Anticline	15	-	8,777	10,637	11	75%
Bexar	NC	Northern KFRs	38	1	2,142	3,594	3	7%
Bexar	NE*	Northern KFRs	16	1	1,958	9,039	3	15%
Bexar	NE*	Alamo Heights	6	-	-	-	-	0%
Bexar	NW	Northern KFRs	10	1	723	8,580	1	9%
Bexar	W	Culebra Anticline	6	-	2,357	3,342	3	51%
Medina	ZEMC1	Northern KFRs	103	1	2,261	2,737	3	3%
Medina	ZNCMC	Northern KFRs	-	-	1	-	0	0%
Bexar	SOUTH	Alamo Heights	5	-	531	3,533	1	14%
SEP KARST REGION			**604**	**6**	**50,456**	**59,135**	**65**	**11%**

Simple SEP-HCP Document Outline with Progress Notes and Questions

GCW/BCV Conservation Program

Priority Questions for the BAT

1. What level of conservation should the plan seek to achieve? (i.e., regional recovery, compensate for all anticipated habitat losses, mitigation for impacts from requested take, or some other standard)
2. How much habitat (in round numbers) is needed to achieve the conservation goal?
3. What are the minimum criteria for preserve acquisitions, management, and monitoring?
4. What mitigation ratios should be required of individual participants to compensate for impacts?

Priority Questions for the CAC

1. What is the anticipated need for incidental take authorization through the plan? How much incidental take authorization should the plan request?
2. Are the mitigation ratios recommended by the BAT practicable to achieve?
3. Given the anticipated amount of mitigation to be provided by participants as compensation for incidental take, will the plan achieve the biological goals recommended by the BAT? If not, should the plan commit to achieving additional conservation (and how much) or should the biological goals be revised (and to what standard)?

Priority Karst Questions -- TBD

Outline	Progress Notes and Questions
1) Introduction and Background	
a) Introduction	
i) Permit Applicant	What entity is the appropriate permit applicant? Default assumption is that Bexar County will be sole permit holder and may delegate implementation/administration tasks to other formal partners, as appropriate.
ii) Plan Area	Committee recommendations for 7-county Plan Area.
iii) Permit Duration	Committee recommendations for 30-year plan/permit duration.
b) Purpose and Need for Action	
c) Benefits	
d) Regulatory Framework	
2) Natural Environment of Plan Area	General background information collected and summarized in draft Resource Assessments.
a) Ecoregions	
b) Vegetation and Land Cover	
c) Aquifers and Geology	
d) Water Resources	
e) Wildlife Resources	
3) Species Addressed	
a) Species Categories	Committee recommendations for covered species. Species in Categories 3 and 4 may be revisited by BAT.
b) GCW	Species background information collected and summarized in draft GCW Resource Assessment. Draft under revision to address BAT comments and new information.

c) BCV	Summarized in draft BCV Resource Assessment. Draft under revision to address BAT comments.
d) Karst Invertebrates	Summarized in draft karst invertebrate Resource Assessment. Revisions completed.
e) Category 3 and 4 Species	Species background information collected and summarized in draft Resource Assessments. Several RAs are under revision to address BAT comments; some revisions are completed.
4) Human Population and Land Uses	
a) Current Population and Projected Growth	Population projections completed.
b) Current Land Uses	
i) Land Uses	Analysis of current land uses completed based on appraisal district data.
ii) Protected Open Spaces	Draft Resource Assessment summarizes currently protected lands in the plan area.
c) Projected Land Development and other Land Use Changes	Draft land development projections completed. Under revision based on committee comments.
5) Requested Incidental Take and Associated Impacts	
a) Covered Activities	Committee recommendations for covered activities.
b) Habitat Loss Estimates for Covered Species	Draft impacts assessments completed for GCW, BCV, and karst. Subject to revision based on land development projections and more refined species data.
c) Incidental Take Request	**How much incidental take of the covered species will the plan/permit authorize?** **How much plan participation may be expected?** **Should take request be capped or otherwise limited for certain geographic areas? By how much and for what reasons?**
i) GCW	

ii) BCV	
iii) Karst Invertebrates	**How much incidental take of category 1 karst species will the plan/permit authorize?** **How will the plan address category 2 karst species? Will the plan need to have a minor/major amendment to be able to issue participation certificates for those species?**
d) Impacts of Requested Incidental Take	
e) Cumulative Impacts to Covered Species	
6) Conservation Program	
a) Goals and Objectives	
i) Community G&O	CAC recommendation on community goals and objectives.
ii) Biological G&O	BAT considering a draft proposal for Biological G&O.
b) GCW and BCV Conservation Measures	
i) Avoidance and Minimization Measures	What are appropriate avoidance and minimization measures for GCW and BCV?
(1) Public information, education, and outreach	
(2) Seasonal clearing restrictions	
(3) Oak wilt prevention measures	
(4) Other?	
ii) Mitigation Measures	
(1) Assessing species impacts for participants	How do you identify and characterize habitat? **How to you measure direct impacts?** **How do you measure indirect impacts?** **What are appropriate mitigation ratios for species impacts?**
(2) Habitat protection	

(a) Target preserve size	**How much habitat protection is needed to balance requested take?** **How much, if any, additional habitat protection is needed to achieve other conservation goals?**
(b) Preserve criteria	**What are the minimum criteria for preserve acquisitions?** **What are the preferred criteria for preserve acquisitions?**
(i) Size	
(ii) Location	
(iii) Configuration	
(iv) Habitat characteristics	
(v) Protection Level/Mechanisms	
(c) Secondary uses of preserve lands	**What types of secondary uses of preserves be compatible with conservation of GCW/BCV?** **Under what conditions may secondary uses of preserves be allowed?**
(i) Public access	
(ii) Infrastructure	
(iii) Agriculture	
(iv) Residential	
(v) Hunting	
(d) Conservation Credits	What information is needed to determine conservation value of a preserve parcel? How is conservation value translated to conservation credits? How do conservation credits relate to impact "debits"?

(3) Habitat Management	Preliminary guidance prepared by BAT. **What are the minimum management standards needed to maintain the conservation value of a preserve?** **What are the target habitat conditions for preserves?** What factors must be considered in management plans for individual preserve tracts? How are management plans prepared and implemented?
(a) GCW	
(b) BCV	
c) Karst Invertebrate Conservation Measures (Category 1 and 2 karst species)	
i) Avoidance and Minimization Measures	Does the team have other ideas (beyond those below) for categories of avoidance and minimization measures for karst species?
(1) Define	How do you identify and characterize karst habitat? Provide definition – probably just use or adapt USFWS (2006) guidelines and also present maps of karst zones and define geologically.
(2) Public information, education, and outreach	What is needed most for education/outreach?
(3) Buffers	What's an appropriate buffer size around caves to protect karst species habitat? How far away from a cave do you have to be in order to not be having any direct/indirect effects? This answer should directly match item ii)1) below ("How do you assess levels of impact").
(4) Gating and/or fencing cave entrances	Gates and fences can have good and bad effects - when should gates be installed?
(5) RIFA control	Use what's in recovery plan or adapt from that?
(6) Construction BMPs	Detail potential BMPs for karst - adapt from TCEQ documents and insert other ideas

ii) Mitigation Measures	
(1) Assessing species impacts for participants	How do you assess levels of impact? See chart created by Zara for how other RHCP's did it. • **Use Karst Zones (Karst Zones 1-2 vs. Karst Zones 3-4)?** • **And/or use Impact Zones based on proximity to karst feature?** • **What is the fee structure?**
(2) Habitat protection	**How much habitat protection is needed to balance requested take? At the moment the team has decided to recover 3 species.** **How much, if any, additional habitat protection is needed to achieve the stated conservation goal of recovery?**
(a) Karst Faunal Area (KFA) criteria	**What are the minimum criteria for KFA acquisitions?** • **3 caves preserved for each covered species - see chart in recovery plan** **What are the preferred criteria for KFA acquisitions?** • **Achieve recovery by acquiring and managing up to 39 KFAs?**
(i) Size	Ideal high quality KFA's are about 100 acres. How much latitude will we allow for medium quality KFA's and even for low quality?
(ii) Location	Describe the geographic spread of KFA's in each KFR.
(iii) Configuration	Typically KFA's contain all PCE's of the cave system, but how much latitude will we allow if it's not possible to have, for example, the entire drainage basin of a cave?
(iv) Habitat characteristics	Ideally KFAs are all natural on the surface, but how much latitude will we allow if it's not totally natural?

(v) Protection Level/Mechanisms	**Should participation permits only be issued in KFRs where 3 caves are preserved for each covered species?**
(b) Secondary uses of KFAs	What types of secondary uses of KFAs be compatible with conservation of karst species? Under what conditions may secondary uses of preserves be allowed?
(i) Public access	
(ii) Infrastructure	
(iii) Residential	
(3) Habitat Management	Define target habitat conditions for KFAs - team has decided that 12 PCE's stated in recovery plan is the goal. What are the minimum management standards needed to maintain the conservation value of a KFA? Given that some KFA's will not meet ideal criteria, what additional management is needed? How are management plans prepared and implemented?
d) Category 3 and 4 Species Conservation Measures	
i) Category 3 species	**What voluntary conservation actions are appropriate to provide for Category 3 species?** What benefits are these measures trying to achieve?
ii) Category 4 species	How will conservation measures for Category 1, 2, and 3 species benefit Category 4 species?
7) Program Implementation and Administration	
a) Roles and Responsibilities	
i) Applicant	Who is the appropriate applicant for the plan? (see Introduction section) What are the responsibilities of the applicant?

(1) Process applications for enrollment	
(2) Monitoring and ensuring compliance with permit terms and conditions	
(3) Annual reporting and on-going coordination w/ FWS	
(4) Acquire and manage preserve land	
(5) Conduct biological monitoring	
(6) Track conservation bank credits and debits	
(7) Staffing and funding	
(8) Public education and outreach	
ii) Partners	How can other partners become involved in the plan? What responsibilities may be appropriate to delegate to formal partners? What types of agreements are appropriate to establish formal partnerships and delegate responsibilities?
(a) Government Partners	
(b) FWS and other federal	
(c) State Agencies	
(d) Counties and Cities	
(e) Academic, Business, and NPO Partners	
(f) Private Landowners	
b) Enrollment Process for Plan Participants	
i) Applications for enrollment	
ii) Habitat Determinations	How is habitat on project areas delineated and characterized? How is survey data or other information incorporated?

iii) Site Plan Review and Impacts Assessment	What project information is needed to determine impacts? How are impacts assessed?
iv) Mitigation Ratios and Determinations	**What mitigation ratios are applied to project impacts?** How are total mitigation needs determined?
v) Forms of Mitigation	What forms of mitigation might be acceptable?
(1) Fees to the plan administrator	
(2) On-site mitigation land in lieu of fees	
(3) Off-site mitigation land in lieu of fees	
(4) Others?	**Do we want to implement a fee structure for degree of take associated with listed karst invertebrates (by Karst Zones or Impact Zones?)**
vi) Alternate Participation Mechanisms	Are alternate forms of participation appropriate? FWS approved habitat determinations? Individual FWS consultations? Can the plan sell conservation credits to federal entities? Or other non-participants?
vii) Participation Agreements and Certificates of Participation	What are the instruments used to formalize participation in the plan?
c) Preserve Acquisitions	What tools are appropriate for preserve acquisitions? What are the minimum standards or criteria for using available tools? What is the process for evaluating the conservation value of potential preserve acquisitions? How are conservation credits generated?
i) Fee simple purchases	
ii) Conservation easements	

iii) Other types of conservation agreements?	
d) Conservation Credits and Debits	How are conservation credits and debits accounted for and tracked?
e) Monitoring and Reporting Plan	
i) Biological / Effectiveness Monitoring	**What types of monitoring are needed to assess the ongoing conservation value and management needs of preserve lands?** **What additional monitoring should be implemented to address other questions? What are those questions and why is the information needed?**
(1) Preserve Lands	
(a) Habitat conditions	
(b) Species status	
(c) Threats	
(2) Plan Area	**What additional monitoring should be implemented to address other questions? What are those questions and why is the information needed? (i.e., monitor status of covered species across the plan area)**
ii) Compliance Monitoring	
(1) Implementation of conservation measures	What measures are needed to measure progress with implementation of the required conservation measures?
(2) Track amount of incidental take authorized through plan	What measures are needed to monitor the amount of incidental take authorized through the plan?
iii) Reporting	What are the required contents of annual reports? What is the reporting period and due dates?
f) Adaptive Management and No Surprises	

i) Identifying Areas of Uncertainty and Changed Circumstances	**What are the potentially significant sources of uncertainty related to the conservation program or covered activities that may impact the effectiveness of the plan?** What conditions represent Changed Circumstances that may be unrelated to the implementation of the conservation program or covered activities?
ii) Adaptive Management Strategies and Responses to Changed Circumstances	What is the process for evaluating Changed Circumstances and responding to such changes? What is the range or limits of acceptable changes to the operating conservation program that may be implemented in response to Changed Circumstances in accordance with No Surprises?
iii) Coordination and Decision-making Process	How often do applicant and FWS meet to review progress and status of the program?
(1) Review monitoring reports and other information	
(2) Determine if Changed Circumstances have occurred	
(3) Determine appropriate adaptive management response	
(4) Other administrative changes/issues	
iv) Unforeseen circumstances	
v) No Surprises Assurances	
8) Funding Plan	
a) Cost estimates	
i) Land acquisition	
ii) Staffing and plan administration	
iii) Preserve management and monitoring	

iv) Education and outreach	
v) Research and other voluntary conservation measures	
b) Revenue estimates	
i) Application fees	
ii) Mitigation fees	
iii) Public funding sources?	**How much public funding is appropriate for implementation and administration of the conservation program?**
iv) Non-assured funding sources – grants, etc…	
c) Projected Plan Budget	
9) Alternatives Considered	
a) No Action Alternative – What happens in the plan area without a regional HCP?	
b) Proposed Plan – What happens in the plan area with the plan?	
c) Other alternatives….	
d) Comparison of Alternatives	
i) How do the alternatives meet the stated project purpose?	
ii) How do the alternatives meet the need for incidental take authorization?	
iii) How do the alternatives satisfy regulatory criteria (local, state, federal)?	
iv) Are the alternatives practicable to achieve?	
v) Other considerations….	

DRAFT

SEP-HCP Funding/Cost
2 Extremes

Funding cost of 2 to 1 ratios in each area (Bexar, Growth Corridors, Rural)

Extreme cost – Higher land values, fewer willing conservation easements

	Acres Dev	Habitat Take auth	Mitigated Acres	Cost
Bexar	83,800	15,586	31,174	761,699,810
Growth	73,500	6,431	12,863	148,398,062
Rural	45,150	1,806	3,212	6,932,647
Totals	202,450	23,823	47,648	**917,046,993**
Mitigation fees				**207,442,922**
Tax Benefit Funding	35% of Bexar Tax Rate	300,000 Per Developed Acre	**567,873,600 Deficit is run for many years**	(141,730,471)
Cost do not Include	Staff Budget	Land Maint	Endowment Funding	

Funding cost of Larger Protected land acquired in rural areas

Lower acquisition cost, many more willing conservation participants

	Acres Dev	Habitat Take Auth	Mitigated Acres	Cost
Bexar	83,800	15,586	3,117	154,720,274
Growth	73,500	6,431	1,286	51,939,322
Rural	45,150	1,806	60,143	3,466,323
Totals	202,450	23,823	64,546	**210,125,919**
Mitigation Fees				**176,574,255**
Excess Cost				(33,551,664)
Excess cost can be funded	Land Protection Bond Issue	Tax Benefit Funding	Room for even greater land protection	Funding available for management,